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MEDICAL APPOINTMENTS: IMPORTANT NOTICE

EDITORIAL NOTICES

DENTAL INFECTION AND TREATMENT OF CHILDREN.¹

By L. ST. VINCENT WELCH, M.R.C.S. (England),
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Instruction, Queensland.

It is with great pleasure I accept the opportunity afforded me of speaking here this evening. The subject which is about to be brought to your notice is of national, I might say, of Empire-wide importance.

It is, therefore, the more gratifying to feel that this Branch of the British Medical Association, in inviting members of the dental profession to be present this evening for the purpose of listening to a lecture by Mr. Haenke, the Chief Dental Inspector of the Education Department, and taking part in a discussion on the dental treatment of pre-school children, is fully seized with the seriousness of dental caries in children and adolescents.

To every member of the medical profession the problem of dental decay is important, whether he be specialist or general practitioner and it, therefore, seems strange that any member of the medical profession either accidentally or wilfully should overlook the teeth and their proper functioning as a weighty factor in the maintenance of good health.

Nevertheless, this in some instances is a lamentable fact which calls for investigation and correction. Who would willingly allow a child to take into its mouth a piece of decayed bone swarming with millions of virulent microorganisms, some of which are causal varieties of man's most deadly diseases; yet that some rotting process is in the case of the teeth frequently permitted to continue unchecked or dealt with in a most perfunctory manner.

I recall an incident in Egypt at a time when visiting a rural village occupied principally by fellahs. In a narrow street redolent of garbage and hazy with clouds of dust children were sitting at play, the while swarms of flies crawled over eyes and mouths. I asked my guide why the parents did not endeavour to get rid of these pests, to which he replied: "It is the will of Allah; He sent the flies. Why, therefore, should we get rid of them?" So I said nothing more. There was nothing further to be gained by argument.

Unfortunately, many people living in our own enlightened communities are inclined to follow much the same lines of reasoning with regard to their children's teeth and to allow unfortunate little sufferers to harbour decayed teeth untreated until such time as an outraged nervous system brings matters to a crisis by staging an acute attack of toothache.

I have not the least intention of stealing Mr. Haenke's thunder and would remind you that I am like the gentleman in *Il Pagliacci* who appears at

the commencement of the play and announces that he is the prologue. It remains, therefore, for me to draw your special attention in tonight's discussion as to where the dentist's province marches with that of the medical practitioner.

Too often, I fear, are we apt to shut ourselves up in water-tight compartments and to deal with matters medical solely from our point of view, entirely disregarding the claims of the other fellow to have discovered something which may both interest us, and enhance our medical prestige if we would but accede some measure of understanding to persons outside our particular calling.

Were a man capable of existing as comfortably and as healthily without sound teeth, it seems reasonable to suppose that Nature would not have taken the trouble to provide him with these aids to digestion. If, however, a great percentage of digestive disorders, general ill-health, anaemia, rheumatic fever, insanity, renal diseases and myocardial troubles can be laid at the door of decayed teeth, it is time that the medical profession grew less apathetic and, having shaken sleep from its eyes, took the professional dentist by the hand and welcomed him as a brother striving to better the conditions of humanity.

If, therefore, this evening we should learn even the rudiments of the causes which operate to produce dental caries, and apply them in our everyday practice by pointing out to our patients the vital importance of early dental treatment, Mr. Haenke will not have spoken in vain.

How is it that a pair of enlarged, inflamed and evil-smelling tonsils are so frequently associated with the disgustingly carious condition of the deciduous teeth.

Consider the number of children with enlargement of the *glandulae concatenatae* and an associated tenderness. Have we not seen abscesses develop in such glands without apparent cause beyond the fact that the child's body resistance had been lowered and that it could not stand up against infection. If so, what lowered it? The throat was not always in that unhealthy condition; his tonsils were sound. I think that sufficient evidence is forthcoming to prove that the tonsils do not produce dental caries, but I am far from satisfied that the converse is not true; but considerable research will still require to be carried out before this important question is satisfactorily answered. There is still a wide field of investigation where observers can record a mass of useful data upon a subject of such prime importance.

One is perhaps rather cautious in one's attitude regarding the radical treatment of infected tonsils. It seems advisable, however, that whenever both infected tonsils and carious teeth exist simultaneously, a dentist should first be called in to clean up the mouth and subsequently local and general treatment of the inflamed tonsils should be attended to by a medical practitioner.

It is more than probable that, if such a course were adopted, the result of dental fitness would

¹ Read at a meeting of the Queensland Branch of the British Medical Association on July 6, 1928.

obviate the necessity for surgical interference in a large proportion of cases.

As the tonsils would appear to be one of Nature's aids to bodily defence and as this need seems to be particularly urgent in early life judging by the relatively huge size of healthy tonsils in young children, it seems possible that there is some relationship between tonsillar activity and the shedding of the carious milk teeth.

In ordinary circumstances a child is supposed to make use of its jaws to masticate its food. An organ properly used is generally a healthy organ and hence the amount of decay of the milk teeth would be negligible. But with the advent of the arrowroot biscuit and pappy malted foods and the cake and soft bread the jaws have little work, the blood supply is reduced, development is arrested or retarded, while acid decomposition occurring in the crevices of the teeth eats holes in the enamel. The tonsils are thereupon called to deal with far more massive septic infection than that for which they were designed and in consequence become overwhelmed and damaged. Then, when both teeth and tonsils are in a corrupt condition, the absorption of virulent toxins, either through the digestive tract or directly into the blood stream, results in lowered body resistance and a subsequent vicious circle.

How often have I seen diseased tonsils sliced off. I say, advisedly, sliced off, because this treatment appears to me to be utterly wrong and quite inadequate, while a mouthful of stinking and rotten teeth is left untouched.

One has, at times, marvelled at the jaunty confidence with which some young practitioners carry out such operations. It gives one a profound respect for the body's power of resistance to infection when no untoward result follows upon the jagged mutilation which from time to time goes by the name of tonsillectomy.

We are well acquainted with the serious effects which an apical abscess or septic absorption from inflamed tooth roots may have on the general health, tachycardia, debility, anaemia and loss of weight; but do we all realize the more far-reaching effects of such conditions, the lowering of mental ability, especially in the child, causing its intelligence quotient to be perhaps two years less than normal for its age, the injury to cardiac muscles and the increased work thrown upon the kidneys? Certain toxins are known to be responsible for or to assist in producing types of insanity. It is not unreasonable, therefore, to suppose that those absorbed from decayed teeth may be among the number.

To the school hygienist diphtheria prophylaxis is a problem which is ever present. Knowing as we do that the microorganisms of this most dangerous disease are not infrequently found in the cavities of carious teeth, it behoves us to do all in our power to clean up these sources of infection. There is, moreover, evidence to show that tubercle bacilli may find a similar resting place and may enter the body by the same portal.

Turning for the moment from immediate septic conditions, it is obvious that a child with severely

decayed teeth resulting in pulp exposure is quite incapable of masticating its food. Hence is fostered the habit of bolting such food in lumps, of softening it with fluids or of rejecting all but soft pappy nutriment. Consequently jaw exercise and pressure upon tonsils is reduced to a minimum with consequent bad results.

We are well acquainted with the small, under-developed jaw, either upper or lower, with in the case of the upper jaw consequent narrowing of the bony air passages. You will have an opportunity of seeing specimens of this dental problem and results which must undoubtedly convince you of the soundness of an argument in favour of early dental inspection and treatment of all children; for you will, as medical men, recognize the futility of producing satisfactory development once the plastic age of early childhood is past. Further, you will agree that neglect is a calamity which must surely leave its mark on the individual throughout life.

Shall we, therefore, be content to let the medical and dental professions deal divergingly with all those problems which are in reality so intimately linked? Will not both sides recognize their duty as guardians of public health and by united effort so educate public opinion in matters of dental hygiene in relation to general bodily health that presently it will be looked upon as a disgrace to possess carious or neglected teeth?

Much has been spoken and written on the causes underlying dental caries in children. Dental authorities will tell you that this condition is largely due to the lodgment of acid-forming foods in the crevices of ill-shaped teeth. Medical authorities will talk at length of vitamins, prenatal causes and deficiency diseases. Has some far-reaching constitutional cause anything to do with the question of these ill-shaped teeth? Have the sins of the fathers been visited upon the children of several generations? In short, has some constitutional disease in its most attenuated form left its mark upon a large percentage of the population?

It seems strange that the condition is so general if there is not some powerful antenatal cause operating. At least 90% of the child population of Australia are estimated to show dental defects of one kind or another. Examine the mouths of the children in any average State school in Queensland and you will be horrified at the dental conditions of the majority.

Consequently you would be justified in inquiring what the Education Department is doing or what it is not doing, that so great a number of children possess such terribly neglected teeth. Several factors are responsible for the inability of the Department to reach a large percentage of these children. Chief amongst these are: (i) parental apathy, (ii) insufficient instruction to children on dental cleanliness and the penalties of dental neglect, (iii) lack of sufficient dental officers in the Department, (iv) lack of assistance from dental hygienists and (v) restriction of dental treatment to those children coming under the provisions of the wage limit clause.

With the first factor we are at present powerless to deal until legislation makes it obligatory under penalty for parent or guardian to have dental defects remedied directly such are discovered. In addition education of the present generation of school children on all matters of oral and dental hygiene is desirable, so that as adults they may pass on by practice and precept such health measures to their offspring. This alone would not be sufficient, owing to the number of high grade morons whom one meets in one's dealings with parents. Hence the necessity for some means of compulsion.

The Department has endeavoured to obtain a measure of authority by requesting parents to sign a form when the child is entered on the school roll, granting departmental dental officers permission to attend its dental needs throughout school life. Unfortunately, this applies only to those coming under the provisions of the wage limit clause.

We are lamentably short of dental officers despite the fact that this section of the School Medical Service is more important in its needs than the medical or nursing sections. Twelve dental officers for 145,000 children! This proportion is ridiculously small and despite the excellent work performed by these officers, often in very trying circumstances, we have but touched the fringe of the problem.

The question has been asked why do we not appoint dental hygienists to assist our dental officers by carrying out the simpler procedure of dental duty. Unfortunately, there is a grave objection to such a scheme and the possibility of such hygienists demanding to be placed upon the dental register after a few years of service with the Department might create an embarrassing situation.

It appears curiously illogical that while the *Education Acts* of the State insist upon the education of every child between the ages of six and fourteen, they do not insist upon the health of those children being of such a standard that they are able to benefit fully by such an education. There is abundance of evidence which could be adduced, to prove that because perfect health is lacking in many who are taught, there is serious loss of money from the waste of the full benefits of the teaching facilities provided. I submit that, as the State provides free education for all, it should take every care that the children are physically fitted to take the fullest advantage of that teaching.

Perhaps in the future the Government of the day will awaken to this fact and will spend sufficient money to treat the dental defects of every school and preschool child in the State. Alas! for fearful leeway to be made up. It seems an impossible task, but the problem would admit of solution if all children of preschool age were examined every six months and dentally attended to. This calls for the establishment of (i) nursery schools and (ii) *Kindergarten*, at which attendance should be compulsory and where early training should take place before enrolment at any school.

This should carry the child on from babyhood to the age of six years. During this period women with as much if not more knowledge of nursing than teaching should be in charge and a careful watch kept for all physical and dental defects which should be remedied.

No child should be enrolled at any school, either State or denominational, until such time as a certificate of perfect physical and dental fitness was produced to the head teacher of such school on its behalf. Once the child is enrolled, school dentists should have unrestricted liberty to keep the teeth whether deciduous or permanent in a thoroughly healthy condition.

Unfortunately upon this point the practising dentists cannot or will not see eye to eye with us. In short, they say: "Hands off! you are interfering with our province, you are taking work out of our hands, bread out of our mouths; the parents of most of these children can afford to pay and you would deprive us of these fees." The reply to this is: "If these people represent so much remuneration to you, how is it that there are in the schools of Queensland so many children, thousands of them, with mouths full of disgustingly carious teeth?"

I submit that, until dental treatment of all children of preschool and school age in the State, irrespective of wage limit clauses or parental objections, is made compulsory, the standard of dental fitness will remain as at present, a grave reproach to a civilized community.

As the children of today are destined to play so important a part in the affairs of tomorrow, we are certainly lacking in vision if we fail to do those things which posterity has a right to demand of us, and one of the chief of these is to see that those bodies which are destined to bear the children of the next generation, are physically sound for this purpose.

I repeat, we are not able as yet to state dogmatically the cause of ill-shaped creviced teeth nor the reasons why teeth decay almost as rapidly as they erupt. We know the effects of unsuitable food on the teeth. We know that certain bad habits in childhood, such as thumb-sucking or comforter-sucking, frequently produce serious malformations of the jaws. But why, then, do we not prevent the one and destroy the other, that foulest of filthy *vade mecum*. In Germany this horrible and uncivilized contrivance is prohibited by law. Shall it be said that we are less enlightened?

Mr. Haenke has expended much time and effort to obtain casts of mouths illustrative of the various dental departures from normal which he is discussing this evening. These have been photographed and are produced as lantern slides. You will, therefore, have the pleasure of actually seeing the original condition as he first found it and the finished product, so to speak, which has evolved out of treatment.

No more striking or convincing argument could be adduced. It is a mute ocular appeal to reason.

THE PREVENTION OF DENTAL CARIES.¹

By A. JEFFERIS TURNER, M.D. (London), D.P.H.
(Cambridge).

OF late years the far-reaching dangers of dental sepsis have slowly become realized by our profession. I can remember the time when we were singularly blind to them. The causation of dyspepsias by the bolting of unmasticated food and the continual swallowing of purulent and septic material is surely obvious. We must regard this as a factor in the production of gastric and duodenal ulcers, probably also of appendicitis. Pernicious anæmia has been attributed to a streptococcal invasion of the duodenum. Dental sepsis, we now recognize, has other and more insidious results. The dental enamel is the only part of the surface lining of the body which is incapable of repair. Once this barrier has been passed, the dentine is rapidly eroded and there results a purulent cavity which can be closed only after the tooth has been extracted or has rotted away after necrosis. The local results of alveolar abscesses and necroses need hardly be mentioned. Far more serious are the effects of absorption into the blood stream of poisons from minute undrained abscesses at the roots of the teeth, to which we attribute many cases of rheumatoid arthritis and other serious degenerations. Oral sepsis is recognized as one of the causes favouring oral cancer. From the teeth to the tonsils is not a far step and septic teeth may induce septic tonsils. I need not carry this argument further. We are becoming keen on the removal of carious teeth. We surely ought to be even more keen on the prevention of dental caries.

By prevention I do not mean conservative dental treatment of incipient caries. That is an excellent thing and we owe much to the labours of the profession of dentistry. I mean the prevention of incipient caries. Among the lower animals, among our palæolithic and neolithic ancestors, among many races now living dental caries was and is rare. Among ourselves it is almost universal. It is a disease due to faulty civilization and its cause is dietetic. It commences in early childhood, almost as soon as the teeth have erupted and progresses more rapidly in newly erupted teeth. It has long been known that dental caries is the result of the erosion of the teeth by the acid fermentation of carbohydrate food lodging especially on the upper surfaces of the molar teeth and in the interstices between the teeth near the gums. Acid-forming bacteria are always present in the mouth and were found by Pickerill⁽¹⁾ in the saliva of Maori children living under native conditions and perfectly free from caries. Teeth vary much in the resisting power of their enamel and before considering the preservation of the teeth I must briefly consider the conditions that favour the formation of strong teeth.

The factors which underlie the formation of good teeth, are complex. We must not overlook the nutritional factor to which attention has lately been drawn by the researches of Mrs. Mellanby.^{(2) (3)} A good supply of calcium, organic phosphorus and vitamins is essential. As the temporary teeth are formed early in foetal life, the mother's diet must contain these. Occasionally one sees temporary teeth so frail that they commence to decay almost as soon as they erupt. These are probably damaged by defective maternal diet, but they are not common. Australian mothers, as compared with those of other countries, are well fed. Let me remind you that human milk in Australia has an average fat content of 5%⁽⁴⁾ as against 3.5% in other countries; this does not indicate defective nutrition. The permanent teeth are formed during the first three years of infancy, the rudiments of the first permanent molars being present at birth. If the infant is not breast fed, there is serious risk not only of vitamin insufficiency, but also of prolonged innutrition from errors of feeding or digestive weakness. These may leave permanent damage to the developing teeth, as indeed may any severe and prolonged illness during this time. Another serious cause of defective teeth is faulty development of the jaws. The developing germs of the permanent teeth are closely fitted in between the roots of the temporary teeth and there is no room to spare. When we consider that the small jaws of a child of six contain no fewer than fifty-two teeth, that is all the milk teeth and all the permanent teeth except the third molars, or when we see the dissected jaw of a child of this age, we realize this. Should the jaw be small, narrow or late in development, all common conditions, the developing permanent teeth are overcrowded and ill-developed. Frequently they are forced out of position and overlap. Like other bones the jaws develop in response to the strains and stresses caused by muscular action. Unfortunately the two year old child is fed almost entirely on soft materials and this stimulus to the formation of strong, broad jaws is wanting. What solid food he does get, such as crusts of bread and bits of meat, are tough but not hard. They require chewing by lateral movements of the jaw and thus exercise the internal pterygoids which narrow the jaws, not the strong biting muscles, the masseters and temporals which broaden them. When the child is a little older, very probably his teeth are so tender from caries that he cannot bite hard things when he gets them. The loss of milk teeth from caries is another serious cause of non-expansion of the jaws, for the tendency of the remaining milk teeth is to approximate. The effect is to damage the permanent teeth. For want of hard biting we develop teeth that will not bite.

All these matters are important, but the strongest teeth, those for instance of Maori children, may succumb to the effects of our faulty diet, and even poorly developed teeth do not necessarily decay. Against dental caries strong teeth are only a passive defence. As efficient teeth are essential to the survival of most mammalia, it is reasonable to suppose

¹ Read at a meeting of the Queensland Branch of the British Medical Association on July 6, 1928.

that Nature has provided some active defence to preserve them from erosion by acids. This active defence against dental caries is provided by the salivary glands and it is their main function, for the digestive function of the saliva is comparatively small. They are the preservative glands of the teeth. The human saliva, of which it is said from 1.1 to 1.7 litres (two to three pints) *per diem* are normally secreted,⁽⁶⁾ is an alkaline fluid. In testing its alkalinity it is, however, necessary to use an indicator, such as methyl-orange, which is not affected by carbon-dioxide. Pickerill⁽¹⁾ in a large number of accurate quantitative experiments has demonstrated the sensitiveness of the salivary reflex to different gustatory stimuli. The saliva from the parotid gland was collected through a cannula in Stenson's duct, that from the submaxillary and sublingual glands by the use of a small apparatus which might be termed a segregator. He has shown that while most foods increase the rate of flow and degree of alkalinity, those with an acid flavour, such as fruits, do so to a very much higher degree. Bread and butter actually decrease both, while the highest figures were obtained with oranges or apples, whether raw or stewed. Combining the figures for rate of flow and alkalinity we obtain the alkalinity per minute which is the important ratio. I quote a few instances from a large number of observations.

Substances Masticated or Used as Stimulant.	Alkalinity per Minute.
Normal resting saliva	1.73
Bread and butter (soft)	1.28
Dry bread	2.84
Cake	2.80
Stewed apple	13.64
Raw apple	14.38
Orange	15.00

Some substances increase the rate of flow, but decrease the alkalinity, but fruit acids raise both to a high degree. The response of the salivary glands is not only sufficient to neutralize the fruit acids, but it persists, to exercise a neutralizing and cleansing effect on the mouth for a considerable period. It is evident, therefore, that dental caries is not due to an "acid mouth." Acids loose in the mouth are speedily neutralized.

Indeed the enamel is eroded by pasty collections of starchy food adherent to the teeth and undergoing acid fermentation *in situ*. The formation of these pastes is aided by the presence of mucin which increases their adhesiveness. As the acid is formed it abstracts lime from the adjacent enamel because there is no other alkali immediately available. The flushing of the mouth with alkaline saliva from the presence of fruit acids mixed with one's bread and butter is a valuable preventive. It was shown by experiment that the consumption of sugar in large amounts had a powerful effect in stimulating the secretion of mucin by the buccal mucous membrane and that the combination of sugar and mucus formed a sticky mass that is perhaps even more deleterious in binding to the teeth material which

subsequently undergoes acid fermentation. We can therefore understand the destructive effects of chocolates and other sweetmeats. The protective value of the saliva does not depend only on its alkalinity; the ptyalin ferment also plays a part by dissolving adherent starchy material. It was found that a biscuit, for example, caused only a moderate increase in the secretion of ptyalin per minute, but the simple addition of some fruit acid to the biscuit increased the ptyalin index eight times.

The delicacy of this reflex, by which not only the quantity, but also the actual composition of the saliva varies in response to the nature of the chemical stimulus to the gustatory nerves, must compel our admiration. In the light of this fact our precautions against the onset of dental caries are in need of careful revision. Pickerill states his conclusions as follows:

1. It is evident that the saliva is a fluid extremely variable in its composition and amount, but these variations do not occur without reason, but rather in obedience to fixed and definite laws and in response to certain ascertainable stimuli.

2. The mechanism controlling salivary secretion is extremely sensitive and complex, since different "flavours" of little intensity are capable of being "selected" and give rise to secretions of saliva differing widely in character and amount.

3. That practically all the normal constituents of saliva are, if present in sufficient amount, of value and importance in protecting the teeth against the occurrence of dental caries and in maintaining the health of the oral mucous membrane.

4. That acids and especially the natural organic acids are the substances that excite the greatest amount of these protective substances per minute and moreover give rise immediately and for a considerable time afterwards to an increased alkalinity of the mouth. That, conversely, substances of little or no distinctive flavour and also alkalis produce a diminution in the amount of protective substances per minute and reduce the alkalinity of the mouth both at once and for some time afterwards.

This statement is not quite accurately worded. The first and transient effect of alkalis is, of course, to increase the alkalinity of the mouth; their secondary and predominant effect to decrease the alkaline flow in the mouth.

5. That in the saliva is provided a natural and potentially perfect mouth-wash acting continuously day and night (not merely for a few minutes a day). That it is, moreover, completely under control; that it may be altered and varied in amount or composition; that its beneficial effects may be increased or decreased absolutely at will.

An analysis of the native Maori diet⁽¹⁾ showed that it was mainly formed of carbohydrates, though birds (mostly small), fish, shell fish *et cetera* were also eaten. The staple food was the sweet potato; they also ate the taro and the starch of fern rhizomes from which all vegetable fibres were carefully removed, leaving a soft dough which was cooked. These foods were flavoured with acid vegetable juices. They took only two meals a day and the incidence of dental caries among them was 1%. Unfortunately Maori children living under European conditions showed an incidence of 95%.

It would almost seem that we feed our children expressly with the object of destroying their teeth.

We give them soft bread and butter, a tasteless food which requires scarcely any mastication, instead of the hard baked bread, which is much nicer. We supplement this with carbohydrate slops and biscuits made with finely ground flour. Not content with three meals a day, many mothers give biscuits and pieces of bread and butter between meals at irregular intervals, so that the teeth are never free from their *débris*. The acid drinks which all children like, are very seldom given at meals. Instead many young children are given tea, of which tannin is a powerful salivary depressant. Fruit is not looked upon as a regular article of diet to be given at meal times and especially at the end of each meal, but as a luxury to be given between meals, when it is least useful, at irregular intervals and often in excessive quantities. And to make things sure, instead of giving them pieces of sugarcane, which would do them nothing but good, we give them large quantities of concentrated sugar in the form chiefly of soft sweets, to excite the secretion of mucin and to coat their teeth with a glutinous corrosive film.

Only by the correction of these errors can we save our children's teeth; we shall certainly not save them by the use of the tooth brush. Our forefathers had excellent teeth without this instrument. Used rightly it has some subsidiary value; it can be used to remove carbohydrate *débris* from the tops of the molars and the interstices of the teeth, preferably at bed time, but it is often used wrongly so as to be useless if not harmful. Most tooth brushes are made so long as to be impossible of being rightly used. The brush should not exceed three centimetres (one and a quarter inches) long at the most. It should have a serrated edge in order that the bristles should penetrate between the teeth. It should be used gently. People who scrub their teeth as though they were polishing boots, are performing a ridiculous ceremony which is often harmful, actually abrading the enamel⁽³⁾ and injuring the gum margins. No tooth pastes or tooth powders should be used; their right place is the rubbish tin. No antiseptics will make the mouth aseptic nor diminish the number of oral bacteria for more than a very short period. They all diminish salivary secretion and so make the mouth more favourable for microorganisms. Alkalis do the same. It is of no advantage to make the mouth alkaline for two minutes at the expense of a continuous natural alkaline flow. On the other hand the use of a dilute solution of acid tartrate of potash sweetened with saccharin is both pleasant and beneficial. Those who wish to assist Nature, should study her methods and work with them, not against them.

What is the present position? Careful inspection has shown that 90% of our school children when first examined have dental caries, 40% have abscessed teeth. The gravity of this menace to health and physical fitness can hardly be exaggerated. I should like to see some signs that our profession is considering this matter very seriously.

References.

- ⁽¹⁾ H. P. Pickerill: "The Prevention of Dental Caries and Oral Sepsis," Third Edition, 1923.
- ⁽²⁾ "Defective Structure of Teeth," Editorial Article in *The British Medical Journal*, February 11, 1928.
- ⁽³⁾ May Mellanby: "Defective Structure of Teeth," *The British Medical Journal*, March 10, 1928, page 410.
- ⁽⁴⁾ H. S. H. Wardlaw and E. E. P. Dart: "The Milk of Australian Women," *The Australian Journal of Experimental Biology and Medical Science*, September 16, 1926, page 129.
- ⁽⁵⁾ J. S. Wallace: "The Teeth and Health," 1926.

THE NEED FOR AN EMBRACING SCHEME OF DENTAL SERVICE IN THE BROAD PLAN OF CHILD DEVELOPMENT.¹

By EDWARD W. HAENKE, L.D.Q.

Chief Dental Inspector, Department of Public Instruction, Queensland.

RIGHT down the pages of the dental profession's history until recent years the central concern of the master minds has been the replacement of lost masticating organs and the repair of partially destroyed, but still salvageable teeth. Such action is laudable, but it has its limitations, for as statistics will readily prove, under existing conditions it is quite an impossible task to attempt to cope with the problem of the appalling present-day prevalence of dental disease in this way alone.

Like an immense flood, dental caries has spread over the civilized world to such an alarming extent that quite a considerable proportion of our population would be unable to find a sufficient number of dentists to fill their teeth were all of those who are in need of such remedial attention, to seek it.

It may be common knowledge that the initial findings of school dental inspection showed that over 90% of our children had carious teeth, but it may not be generally known that the initial inspections of the infant portion of our schools revealed the fact that 40% of the children had unmistakable abscessed teeth, whilst every third or fourth child had not the proper masticating surface and that these conditions continued and grew worse until in the higher classes the teeth as a crushing and masticating machine were positively ruined in a large proportion of children by the time they reached the age of twelve or fourteen years.

Taking our school statistics as a basis, a conservative estimate of the prevalence of dental caries amongst our people would allot five cavities to every mouth. Approximately speaking, this will give over three and three-quarter million cavities in the teeth of our State's population. Allowing half an hour as being an average time necessary to prepare and fill one cavity, it would require approximately a thousand dentists working eight hours a day for five days in the week continuously throughout a year to deal with already existent defects. As the number of registered dentists in the State is but three hundred odd, the hopelessness of the

¹ Read at a meeting of the Queensland Branch of the British Medical Association on July 6, 1928.

dental profession adequately meeting the current needs of our people under prevailing conditions is very obvious.

What is true of Queensland is, it is thought, equally true of the other Australian States. When this was realized and the profession's responsibility regarding the situation was recognized, the conclusion became established in professional circles in an ever-increasing measure that if we were to meet our professional obligations, we must do something more than merely to repair the ravages of dental caries for a section of our people now living. To face the problem satisfactorily it became evident that we would have to seek out and apply a means to stem the tide of caries rather than to hope for a sufficiently great increase in our professional numbers to repair its damage.

As an aid to this end, representative professional bodies in the different States through their persistent advocacy, succeeded at different times in inducing certain of the education authorities to introduce schemes of school dental service as an integral part of the State education systems, with the object of gathering statistical information and ultimately evolving a means of contributing to the solution of the dental caries problem in a comprehensive and scientific way.

Following upon representations made by the Odontological Society, the Queensland Government was the first Australian authority to take definite action in the matter of dental appointments to its service and the first Dental Inspector of Schools was appointed in the year 1911. Having completed an inspection of all schools in the State and having obtained detailed statistics of the oral conditions existent amongst the children throughout the State, a definitely organized system was propounded and officially accepted in the year 1916 and in a partial and variable way that system has been in operation up to the present time.

Zealously applied, the scheme has proved itself intensely practical and it has been suggested that I should discuss certain phases of the work to show its far-reaching possibilities and to emphasize what an urgent need there is for extensions to such child welfare work in the broad plan of child development.

In formulating the system, school dental service has in a general way been separated into three aspects: (a) inspection, (b) clinical and (c) educational.

The actual inspection is conducted for the detection of defects and the compilation of statistical information; dentists at the clinic deal on a definite basis with the alleviation of suffering and the cor-

rection of existing defects, whilst the educational phase is concerned with instruction on matters of dental importance, particularly relating to oral hygiene and prophylaxis.

It is urged that the strict and thorough observance of each individual phase of the work is essential if the ultimate success and highest aims of the scheme are to be attained and in briefly discussing some of the results of the work I shall deal with the subject under the three headings mentioned.

Inspection.

Prior to the official adoption of our present system a detailed examination was made of the mouths of the entire school population in the State, embracing over 1,100 schools with an attendance of nearly 100,000 children distributed throughout an area of 670,000 square miles of territory. From these inspections complete statistical records were obtained, from which the oral conditions witnessed can be gathered. Owing to lack of space it is, of course, not possible to include herein the complete results of these examinations, but as certain of the findings may prove of general professional interest, portions of the total details have been summarized and they are included in the subjoined table:

As expected, dental caries is the most serious group of pathological conditions recorded, because of its widespread prevalence and pernicious results. Of the teeth of all children examined 26.12% were found to be carious. In the case of boys 20.8% of the permanent teeth and 38.9% of the deciduous teeth were found to be affected, whilst with the girls 19.8% of the permanent set and 37.6% of the first dentition were found defective.

It is claimed that the extent of caries is gauged more accurately upon such a basis of comparison than by taking the percentage of children who are affected by the disease, as in the latter case a child with one defective tooth is placed in the same category as a child with a number of defective teeth. In comparing the prevalence of caries in individual schools or in different districts, we accordingly take as a fairer basis of comparison the average number of carious teeth per child or better still the percentage of carious teeth amongst the total number of teeth examined, as signified in the above figures.

The results in the individual schools in different portions of the State often varied appreciably, the figures pointing to a relation between the incidence of caries and external environment conditions. In every instance the variability where it existed to any pronounced degree, could be associated with the two factors, in diet and function. Indeed, I think

TABLE I.—SUMMARY OF RESULTS OF DENTAL INSPECTION IN QUEENSLAND.

Number Children Examined.	Number with Sound Mouths.	Condition of Mouth.			Use of Tooth Brush.			Number of Teeth Examined.			Number of Cavities.		Percentage of Boys and Girls with Dirty Mouths.	Total Number of Defective Teeth.	Average Number of Defective Teeth per Child.
		Clean.	Fair.	Dirty.	A.	B.	C.	Permanent.	Temporary.	Total.	Permanent.	Temporary.			
96,000	7,918	17,750	47,250	31,000	16,500	53,500	25,000	1,272,259	888,251	2,160,510	356,174	248,810	32	604,984	6

it would be correct to say, as Pickerill claims, that the numerical incidence of the disease was largely proportionate to the attained state of civilized diet and the consequent degree to which mastication was practised or neglected.

The most pronounced diminution in dental diseases was found amongst the children attending aboriginal schools, schools in certain fruit areas and certain schools situated in remote areas of the State.

As on previous occasions before the Public Health Association, I have discussed in detail the variations under these headings, I shall refrain from making detailed reference to the matter on this occasion. As an interesting example of the influence of diet and function, it may, however, be permissible to cite the case of an aboriginal school where, following upon an alteration in the environment of the children, a pronounced progressive increase has occurred in the incidence of caries and quite a distinct and unmistakable change has occurred in the nature of the oral secretions and the previous excellent standard of natural oral cleanliness which prevailed amongst the pupils.

At my first visit to the school, some eleven years ago, in order to place all the children in the school with sound mouths, it was necessary for me to perform only eleven fillings and sixteen extractions. At a recent visit to secure the same result for only half the number of children, I found it was necessary to perform four times the number of fillings and five times the number of extractions. At the time of my first visit to the school a section of the children at least lived in a manner somewhat resembling their natural state. The rations were meat, flour and tea with a very limited sugar allowance. The meat allowance was not sufficient to supply their needs, but they were able to and invariably did bring it up to requirements from Nature's storehouse. On several occasions I examined some of the damper they had baked and the meat they had cooked and no doubt was left in my mind as to the absolute necessity for the adoption of a vigorous functional activity on the part of their dental organs.

Some years ago a change was made in the administration of the settlement and it was handed over to the control of a religious body as a mission colony. Following this action the children's dietary and whole environment were made to conform to our more civilized customs and I do not hesitate to attribute the deterioration in the oral conditions to this one cause. The deprivation of a pleasing form of diet seemed harsh opposition to the new order of a more generous provision for the aboriginal child, but the dictates of my professional judgement overruled such feelings and I was compelled to recommend to the governing authorities that drastic restrictions should be placed on the supply of biscuits and sweets made available to the children.

Owing to the natural cleanliness prevailing in the mouths of these aboriginal children, I have never advocated the use of a toothbrush in this school. With the altered conditions and changed environ-

ment, however, it seems as though its advocacy will become essential unless, of course, strict adherence is given to the dietary suggestions which have been advanced. As is seen in Figure I, the type of mouth encountered at the first inspection at this school presented a very different picture to those encountered at the last visit. In the former case, because of the environment, the mouths functioned satisfactorily, the molar teeth showing very positive indications of a constant and vigorous usage. In the latter case, because of the changed environment, the demand for correct function was lacking. As a result there is observable in the two models a pronounced contrast in development both in the dental and osseous tissues and there is also evident a striking difference in the incidence of caries.



FIGURE I.
Aboriginal models showing evidence of a strict observance and a regrettable neglect of function following change in environment.

As organs of incision and comminution the teeth are endowed with important specific functions and their normal arrangement and development can be accomplished only by a generous mechanical stimulation during the periods of their growth through the adoption of a diet and environment which will necessitate the thorough observance of their fundamental uses.

Of all organs of our body our civilization has interfered with none during childhood to a greater degree than the dental organs and never has this been more forcibly impressed upon me than when viewing in comparison the varied types of mouths encountered in my official school examinations.

Clinical Phase of System.

Acting on the principle that when a difficult passage has to be negotiated, a primary obligation is to remove from the path all obvious obstructions, it is considered a foremost essential in our system of school dental work to remedy existing defects. The acknowledgement beyond doubt of the impracticableness of dealing with the school population as a whole except through the employment of unlimited facilities at an altogether prohibitive expenditure, resulted in the acceptance of a system whereby through the operation of reasonable means adequate and repeated service would ultimately be given to the best permanent advantage and in full accord with the dictates of modern dental science.

Briefly the scheme provides that in the first year all efforts shall be concentrated on children under eight years of age with at each annual reinspection,

a progressive increase in the age limit, so as to include all children previously examined and thus to follow them up right through their school life. In this way a definite, annually increasing number of children is attended to; the decay in the permanent teeth is met in the majority of cases in the early stages when restorations can be more readily accomplished and effective action is taken so that disease in the permanent teeth does not progress to a serious irremediable extent.

The scheme accordingly resolved itself into a proposition aiming in the first place at the preservation of the six-year old molars for a definite section of the school population with the purpose, through subsequent extensions of ultimately bringing the full permanent dentition of all school children under effective surveillance and control. Fully cognizant of the crying need for operative services and as fully aware of the barriers which make the attainment of such service quite prohibitive to a certain section of the school population, we have made provision under the system whereby gratuitous treatment is rendered available on the following conditions: (i) Where there is a practising dentist, treatment is performed only for those children whose parents' income is under a stipulated amount; (ii) if the children are not living within reasonable access of a practising dentist, treatment if desired may be claimed for all children examined, regardless of the parents' income.

During the past two years an opportunity was afforded to me personally to conduct investigations which revealed some interesting data regarding the value of school dental work and the possibilities attaching to the clinical phase of our school dental service. Owing to varying circumstances in latter years some of the schools visited by me during the past two years had been affected by conditions which in some instances had curtailed the application of work, and in other cases had altogether prevented it. Thus it was possible for me to divide the schools I visited during the past two years into three classes: (i) Those in which the work had to be reinitiated, (ii) those in which the system had been applied during recent years with varying degrees of regularity, (iii) those in which for a number of years complete treatment had been performed and followed up, in strict accordance with official requirements.

A comparison of the findings in these groups of schools accentuated three broad facts. The first was the tremendous size of the problem which dental disease presents and the enormous amount of investigation which is required in order to obtain a true appreciation of the factors in the problem of dental decay and other affections of the teeth and soft tissues of the mouth. The second broad fact was the appalling amount of disease presented in those children entering school. The third was the importance of early treatment and regular reinspection and retreatment as prescribed by our system.

In those schools in which the work was initiated, the proportion of those inspected who were found

to need treatment was 90%; in those schools where the scheme operated only at irregular intervals the average proportion was 70%; whilst in those cases in the same district where a regular continuity of service had been available, the proportion was 40%.

At the class (i) group of school it was found that owing to the ravages of caries two or more permanent teeth had been rendered functionless in 45% of children; in the class (ii) group the percentage was reduced to twenty-eight, whilst in the class (iii) section it was barely two. Such figures surely give a clear and impressive indication of the value of careful conservative attention and follow-up treatment in the early stages of disease.

The life of a child from a dental standpoint might be divided into three important and distinct ages, babyhood, the preschool age and the school age. The babyhood period might be dated from birth to two years, the preschool age from two to five years and the school age from five years on through later childhood to twelve or fourteen years. The age of babyhood is, of course, considerably limited as far as actual operations on the teeth are concerned and such operative procedures as are necessary, might be grouped under the two headings, prophylaxis and emergency work, as nearly all consist of either the removal of stain from the teeth or the extraction or treatment of a deciduous tooth for the relief of pain. The preschool age is one which offers a great field for dental operative effort, and it is this age which is actually most neglected or avoided, for at this age the little patients are perhaps more difficult to handle than at the other ages, standing as they do between babyhood when a dentist can and usually must perform the work more or less forcibly, and the school age when the child is old enough to be reasoned with.

At the preschool age the child has not come under the direct influence of school dental inspection or it has not been subjected to a private dental examination except in rare instances and as a result it is generally found that there is a pressing need for prophylaxis and reparative work amongst the deciduous teeth of this group of children, not only as they approach the school age, but unfortunately long before this time. In perusing some of my preschool records I came across one of a child, aged three and a half years, who exhibited in her mouth thirty-one carious cavities in her twenty deciduous teeth. Seven of the number were abscessed to a serious extent (see Figure II). The handicap imposed upon the child by such an oral tragedy can well be imagined. Admittedly such is an extreme

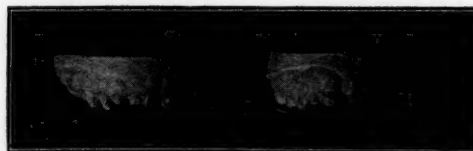


FIGURE II.

Upper and lower teeth in child, aged three and a half years, showing thirty-one carious cavities in her twenty deciduous teeth.

case, but there are hundreds of children being annually enrolled in our schools throughout the State with oral conditions very little better. Amongst all the entrants to school in the batch of schools visited by me personally during the past two years, the percentage of deciduous teeth which were carious was 39.8 of all the teeth examined.

It is difficult to estimate the harm done to the general health and the permanent dentition by the amount of disease which these figures represent. By the time the child enters school, much of the dental disease is not only established, but is beyond repair and we are forcibly reminded that an urgent child welfare question that awaits solution is a considered scheme of preschool dental care which is sufficiently comprehensive and elastic to meet the needs of all those children of preschool age who are in need of attention and are not able to obtain it privately.

When called upon some years ago to give evidence before the Federal Commission on Public Health, I stressed this need and our continued school experience more and more justifies the claim. We care for the children when they enter school, but previous to that there is little or no provision other than for the small section who visit private practitioners. Surely the time has come when from a national health point of view we should consider how inexpedient it is to withhold from our juvenile population in their preschool days the dental treatment of which they so urgently stand in need.

A system of preschool dental service in operation would prove of incalculable assistance to the school dental officer in his efforts to control dental disease in the permanent dentition of the school age group of children who come under his care.

Caries is often found in the approximal surfaces of the anterior deciduous teeth or the occlusal surfaces of the posterior members at the age of two and a half years, but by the use of sharp instruments in deft hands it is quite possible even at this age to carry out an effective treatment or restoration which will enable the child to perform the function of mastication satisfactorily and retain the teeth till the time of eruption of the permanent dentition.

At the clinic under my charge I frequently have parents bring children of preschool age to me for attention and advice. Initial difficulties are sometimes experienced in such cases owing to erroneous parental counsel or a lack of knowledge in child management on the part of the parents but eventually in the large majority of cases the final issue is a result of a highly satisfactory nature.

Quite recently a child, aged three, came along on her first trip to the dental clinic accompanied by both father and mother. On her way she was told that "unless she was good, the dentist would pull out all her teeth." Small wonder was it that she arrived crying, cringing and hysterical and in no condition for more than a passing examination. The mother endeavoured to explain that the child's nervousness was due to the father's thoughtlessness in making a remark to the child such as the one mentioned. The father could not be induced to shoulder the blame, however, and expressed it as his

opinion that the mother had bought the child too much dinner and she was "just out of sorts."

Placed in the position of arbiter, I inquired what the child's dinner consisted of. To my consternation I was informed that dinner had been procured in town and the meal included two sausage rolls, a banana, an ice cream and half a glass of lemonade. I needed no further information. The blame was mutually divided. I could readily understand the child's behaviour and for the time being at least I felt convinced that the school dentist's biggest problem was not so much the actual treatment of the child as the education of the parents.

My examination of the child's mouth showed that hygienically it was in a bad state. The sporadic attempts that had been made at cleaning the child's teeth were worthless. Evidently, believing in getting the most for his money, the father had purchased a brush for the child which might have been of use as a nail brush, but could not possibly be used to any good effect in cleaning the child's teeth. In facing the situation, I determined to deal with the problem of the parents at this visit and defer treatment of the child to a subsequent visit, recognizing that if a dental operator has to do his treatment well he must have the child in the frame of mind where she can be induced to cooperation.

Too frequently, I fear, we dentists overlook the fact that it is just as necessary to conserve a child's nervous system as it is to conserve his teeth. It is thought quite possible to carry dental treatment for a child to the point where the nervous system may be unduly taxed or there may be instilled such a fear of dental operations that it is impossible to get the child to return again to the dentist and thus may we defeat our purpose.

At the child's second visit, through the adoption of a kindly attitude in the absence of the parents I was able to strike a chord to which the child instinctively responded and the treatment of the patient was no longer a problem. During several successive visits I inserted five fillings in the deciduous teeth and on the last occasion I found it possible to extract an abscessed molar through the use of a local anæsthetic without the slightest trouble. Following upon advice given the child reported at the clinic on one occasion since then for examination and it was gratifying to witness that the toothbrush had been used with good effect twice daily and the oral standard of health was a striking example of the benefit of early treatment and prevention.

To attain success as a children's dentist a person must possess the qualities of tact, patience and sympathy to no ordinary degree. He must understand children and be able to appreciate the child's outlook and the child's point of view. Many a time an unsuspecting clue is dropped from the lips of a child patient and if the operator is agile-minded he will be able to catch the lead which it gives, and through its aid pursue his work to a successful issue. If a man possesses the natural qualities which school dentistry demands, there is no more fascinating branch of dental surgery; but if a person embarks upon it without these qualities, there

is no branch of dentistry in which failure will be more swift and certain.

As the following case (Figure III) will show, the degree of indifference shown by some parents in the matter of the dental welfare of their children is almost unbelievable at times. The illustration shows a pronounced irregularity in the mouth of a child who came on one of my early lists for treatment. The first model shows the arrangement of the teeth before treatment, whilst the second shows the mouth after treatment had been undertaken and completed. It was painful to witness the parents' unconcern regarding this child's oral deformity. The child was entitled to departmental treatment, but the full extent of the parents' interest in the mouth was centred on "that one tooth which ached." Treatment for that tooth was performed and an endeavour was then made to arouse the parents' interest in the greater defect, that of the dental apparatus as a whole. It was pointed out that if the child would promise to come along regularly for treatment, the irregularity would be remedied.



FIGURE III.

Pronounced irregularity in permanent teeth and satisfactory result secured from orthodontic treatment.

The picture painted was, however, altogether too visionary for the parent, but at length the barrier of indifference and distrust was surmounted and the mother's enthusiasm was raised to the extent that she finally remarked: "Well, she can go if she likes." She came and it is satisfactory to record that the result raised the parents' conception of the value of dental treatment from a level that was lamentable to one that was commendable.

To obtain the maximum results with the minimum of operative effort, treatment must begin early and be systematically followed up at regular intervals. Direct observation of many thousands of children leads me to affirm definitely that the masticating surfaces of the large majority of six year molars, because of developmental fissure defects, are predisposed to become carious and until we succeed through rational means in preventing these fissure defects, our ideal weapon for the salvation of this valuable tooth will continue to be prophylactic operative attention prior to the establishment of caries, by the careful insertion of fillings with reliable material after the prevailing fissure defects have been cut out and cavities have been properly prepared. Our school experience has been that if in a child six or seven years of age the fissure defects

in the four six-year molars are thoroughly filled in accordance with the accepted principles of cavity preparation and caries in the deciduous teeth is effectively dealt with, the result invariably is of a highly satisfactory nature. Frequently, indeed, it can be classed as spectacular. If this action is taken, rarely is further operative treatment required for these children up to the age of ten years.

However, owing to the lack of time and the pressing demands for attention, we are usually compelled to restrict our fillings to those teeth in which decay is definitely established, and to practise the more ideal procedure only in those exceptional instances when time and numbers permit of its application.

Under present financial circumstances it seems hopeless to expect that a sufficient increase in facilities could be provided to render the ideal procedure universally possible, but it is our devout hope that in time through a process of gradual development the matter will receive the attention which it deserves.

In spite of a definite clamour for professional action concerning them, we are forced to the admission that the deciduous teeth too often do not receive the attention which they deserve in the matter of professional treatment. Our school inspections frequently reveal the fact that after the carrying out of filling operations in the permanent teeth with complete satisfaction, a creditable result from the point of view of mouth health is marred because the operator fails to give attention to certain carious temporary teeth. Possibly, the reason why the deciduous members remained untreated was because the dentist respected certain professional teaching regarding the matter. It has been heralded as an axiom in certain dental circles that if the dental apparatus is to develop to a degree sufficient to accommodate the permanent teeth, the deciduous teeth must remain in position in the mouth and function during their allotted time.

By the overlooking of the importance of function and by the undue stressing of the claim that the retention of the deciduous teeth is necessary to prevent malocclusion in the permanent dentition, there has been a distinct disinclination amongst many dental practitioners to extract the temporary teeth unless it is time for the corresponding permanent teeth to erupt. The important rôle played by the deciduous teeth in their relationship to the eruption of the permanent teeth is fully realized; the retention of the deciduous teeth until normally shed may undoubtedly be a big factor in assuring normal eruption of the permanent teeth, yet it must be understood, I think, that if the deciduous teeth are to do their part in jaw development, they must be in a healthy and functional condition.

I personally am emphatic in the opinion that infected roots and deciduous teeth that are extensively attacked by caries, will not assure normal development of the dental arches, however long they are retained. Rather will their retention be inclined to hamper such development at least once the six-year molars have erupted.

Because of this conviction and aiming at the establishment of as high a standard of mouth health as is practicable amongst the children we are called upon to treat, we in our school work make it a routine procedure once the six-year molars are well in position to remove all carious deciduous teeth with the exception, if possible, of the four deciduous canines. Such a procedure permits the permanent teeth to erupt with benefit into a healthy environment. It eliminates the early possibility of caries on the approximal surface of the six-year molars and by permitting the mouth to function correctly, our experience teaches that the procedure more often benefits rather than restricts the correct eruption of the permanent dentition.

Extensive evidence is available where the practice of such a course produces results which are such as will excite feelings of real gratification. As stated previously, if in a child of seven years of age the four six-year molars are filled on the occlusal surfaces and the temporary molars are removed, the child invariably goes for four years without any further conservative attention being required.

Prior to the eruption of the six-year molar we do not favour extensive extraction of the deciduous teeth if it can possibly be avoided through the judicious use of conservative treatments. There are times, however, even then when circumstances make the former course imperative. Where the deciduous teeth are extensively broken down from caries the effect on the child is sometimes profound. In the first place the effect on the teeth is that their utility as organs of mastication is destroyed, their structure being so damaged that the area of masticating surface is lessened. The destructive process eventually reaches the pulp chamber so that the tooth becomes excessively tender and the child cannot chew because of the loss of tooth surface and will not chew because of pain. Food is in this way swallowed semi-masticated.

Thus the retention of infected teeth is more likely to retard rather than promote jaw development. The mouth, being in a state of disease, is a possible breeding ground and habitat for untold numbers of bacteria, many of which may be virulent types. There is in this way set up a vicious cycle with far-reaching ill effects.

No enlightened dentist today advises an adult to retain a badly abscessed tooth simply because its loss may upset the balance of normal occlusion and the same knowledge of focal infection should be applied to a child with an abscessed deciduous tooth. General health should be the foremost consideration and accordingly if either deciduous or permanent teeth are infected and cannot without any doubt be placed in a healthy state, our routine practice in our school operative work is extraction and careful observation of the results following such action justifies its continuance.

Figures IV to VII depict typical conditions in patients treated by me at a country school visited recently. They illustrate the course of treatment advocated and accepted as a routine operative procedure in our school work.



FIGURE IV.
Typical state of mouth when the child is first brought under the care of the School Dental Officer between the ages of six to eight years. The six year molars are erupted and in a large proportion of cases show developmental fissure defects, whilst the deciduous molars are hopelessly carious.

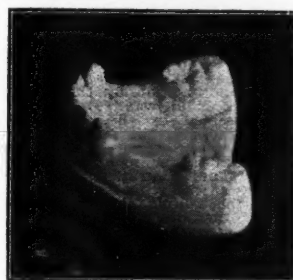


FIGURE V.
State of mouth at second year's visit to school. At first visit the routine treatment was carried out, the fissure defects in the six year molars were cut out and filled and the deciduous teeth with the exception of the temporary canines were extracted. The illustration shows ample room for the permanent teeth which have yet to erupt.



FIGURE VI.
Shows case, where owing to extensive caries, the canines as well as all other deciduous teeth were removed at first visit. In these instances also, if the six year molars are well erupted prior to the extraction of the deciduous teeth, rarely is any crowding of the permanent teeth experienced.



FIGURE VII.
Shows cases Numbers V and VI at later visits, after eruption of bicusps. No crowding in permanent teeth is observable and this is a typical experience.

Figure VIII shows certain ill effects in the permanent molars through the retention of the deciduous molars. The mouth is that of a child in the same school who was not eligible for treatment by the school dentist.



FIGURE VIII.
Mouth of Child, aged eight and a half years. Following upon notification by the School Dental Officer when the child was seven years of age fillings were inserted by the child's dentist on the occlusal surfaces of the six year molars, but the temporary molars were untouched and were allowed to remain in the mouth, although extensively carious. The illustration shows the mouth at the next visit to the school. Large cavities are discernible on the approximal surface of each six year molar with the pulp involved in each instance. This is a very frequent happening if the carious deciduous molars are retained in this manner.

At the Ipswich Clinic I have a selected batch of children for whom I am taking models and making comprehensive records once a year with the idea of securing evidence relative to the processes of development and drawing comparisons between the development that follows effective treatment and that which occurs naturally with disease conditions present and uncorrected. Time prevents me from doing more than to make a passing reference to this matter on this occasion.

Dental caries is an affection which commences with the disintegration of the prisms of the enamel. This disintegration is at times discernible by the patient, because there exists a more or less large visible cavity, but long before it was visible to the eye, caries was already present. Hence a parent cannot rely on the circumstance that the child does not complain or that no cavity is visible to them. To await for such an occurrence is usually too late from the point of view of correct tooth conservation.

There is a universe of truth in favour of early remedial care and modern research supports in an ever-increasing measure the crusade we have launched in our schools in favour of preventing tooth troubles, reaching such an advanced stage that the dentist can no longer effect a cure, but merely improve or postpone the loss of the part.

To show the value of early examination and early treatment and regular follow-up examination and treatment as prescribed by our system, I submit the following photographs of the mouths of two sisters who have been regularly examined and treated by me since their entrance to school (Figure IX).

Mouth No. 1 (Figure IX) has been on my treatment list and has received regular care from me

once a year since her entrance to school at five years of age. The picture shows her mouth at the age of fourteen with a set of teeth of which she can well be proud.

Mouth No. 2 (Figure IX) shows the teeth of her sister at the age of twelve. Because she was not suffering from toothache and "did not want to be done," the parents disregarded the early dental notification and made no claim for treatment for this child. At the age of twelve the child's pride made her change her mind and the parents made a request that she be placed on the treatment list. I examined the mouth thoroughly and found that the amount of time necessary to render this child reasonably efficient from a dental point of view would be ten times as great as the accumulated time spent on the other child's mouth.

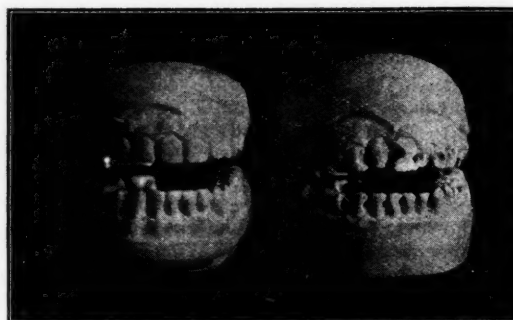


FIGURE IX.
Mouths of two sisters showing value of proper school dental service and neglect of same.

Through early and regular care the former child is discharged from school at the age of fourteen dentally efficient in a very full measure, whilst through sheer parental indifference or ignorance and the lack of professional attention, the latter child at the age of twelve is positively crippled dentally. Yet at the time of the first inspection, judging from the natural tooth development and the physiological oral environment, the prospects for Mouth No. 2 were far better than for Mouth No. 1.

Before hope may be nurtured for the inhibition and cure of dental caries the causes must be understood. The progress of dental decay may be summarized as follows. Making its initial attack on the enamel in some favourable site, possibly a developmental defect, it invades the dentine until the pulp is affected and is eventually destroyed. The disease processes continue on through the end of the root attacking the periapical tissues and from this focus the vital organs of the body may become involved. It may be and in fact is a long cry from a diseased tooth to a defective heart, but to the best of our ability to judge it is possible for the one to be the beginning of the other.

The recognition of the fact that the teeth are a frequent location of focal infection places in the hands of the dental profession the means of doing invaluable good in the prevention of disease and gives dentistry an added importance to humanity.

It is unmistakable that the vital relationship of dental and oral conditions to the health of the body have been receiving more and more consideration, not only by members of the medical and dental professions, but by the public at large. The time is long past when the teeth are regarded as occupying an isolated position in the bodily economy, when it was thought that they might be permitted to remain in a diseased state in the mouth without eliciting a protest from the vital forces of the human economy as a whole.

The results of scientific research of clinical experience and professional study and observation all contribute to the generally accepted conclusion that whatever factors menace the health and integrity of the dental organs, become a menace to the health of the body. It is difficult to grasp the full significance of this latter day point of view that oral health is a factor of prime importance to bodily health, unless its far-reaching possibilities are visualized. It portends revolutionary changes in so many directions. It is not contended, of course, that dental and oral foci of infection are the only or principal causative factors in the production of chronic systemic diseases, but it is insisted that their importance is such that they should never be overlooked in the search for ætiology.

Excessive enthusiasm, however, should not be permitted to supersede good judgement in the matter, as, whilst it is believed that in very large numbers of cases the primary focus is in the teeth, the possibility of this not being the case must be realized. Nevertheless, because of the possible evil consequences following the retention of infected teeth, there is greater justification for a dental operator to err on the side of excessive extraction than in the other direction. A definite diagnosis in the matter of focal infection is at times exceedingly difficult.

A vital question on which in his round of duties the school dentist is invited to give a decision about at times is the case of a pulpless tooth in the mouth of a special patient referred to him by a local medical practitioner in a locality that is without a resident dental practitioner. According to information given by the patient's medical adviser, ill health is seriously affecting the patient and after other possibilities have been eliminated an opinion is sought regarding the possibility of there being a dental focus of infection. In one such case that came in my own experience, circumstances permitted me to verify my finding by arranging for a radiographic service from a friend who was practising in a township some distance away. This, however, is rarely possible and in such instances in the absence of any definite diagnostic sign by which we can say that the tooth is a source of infection, the practice is adopted of extracting the tooth on suspicion.

Whilst fully realizing what the loss of a tooth might mean to a patient did it not prove a source of infection, I think the action is justified when it is considered what harm might happen to the patient from the broad point of view of health were

an unsuspected infected tooth allowed to remain in position in the mouth.

There is possibly justification for the opinion that at times in matters such as this the dental practitioner takes too narrow a view. He considers the matter from a purely dental point of view, but surely the body general is more important than the body local. The true task and duty of dentistry can be sensed and performed only when we realize that the mouth is but a part of the whole human economy. This is a truism, but its truth has not been taken sufficiently to heart. Just as the mouth can be intelligently cared for only by one who realizes that conditions in the mouth, in other parts of the body and in the body itself as a whole are mutually interactive, so within the mouth itself only inadequate service can be rendered unless the dentist in treating any particular condition in the mouth pays attention to the condition of the mouth as a whole.

Prompt execution and serviceableness of dental repairs are decisive factors in dental maintenance. When repair is delayed until the pulp is endangered or when the repair fails to protect the tooth and restore function, the ultimate service of the tooth is definitely reduced. To avoid pulp involvement, the carious processes must be discovered and combated soon after the dentine is invaded. The greatest time-consuming factor in operative dentistry results from pulp complications. When caries is neglected until the pulp is involved, sensitiveness of the tooth retards operative progress; treatments may then be necessary to allay inflammatory conditions; the extirpation of the pulp with tedious root canal operations may be required or an attempt made to retain the pulp in the tooth in a vital and healthy condition may prove unsuccessful with consequent vexatious results.

Through early examination and early remedial care we avoid these time-absorbing procedures and there is thus made possible the attainment of a standard of operative accomplishment in our school work which will stand the test of the closest scientific scrutiny.

The ill effects from pulp involvement in mutilated and neglected mouths are varied and complex and cannot be overestimated. This is one of the great problems of dentistry today, for it touches health as nothing else in dentistry does and I do not hesitate to say that its best solution lies in the avoidance of the condition on the lines prescribed by the operative procedure adopted in connexion with our system of school dental service.

It cannot be denied that pulpless teeth are potential foci of infection and whilst we may not belong to the class of those who condemn all pulpless teeth, we do believe that a vital tooth is far better as an integral unit than a pulpless one and there is satisfaction in knowing that through our scheme because of early detection and early and repeated remedial care we are not adding to the number of possible foci of infection, but are actually reducing it. The importance of the contribution to health and well-

being rendered by our system through the avoidance of pulpless teeth is a fact that is worthy of the utmost appreciation.

Any dental service that does not give reasonable promise of durability providing that the patient does his part, is unworthy of present day dentistry. Modern operative technique and its proper application by a diligent, capable dentist can provide restorations that are quite the equal of natural teeth in function, comfort and appearance, if treatment is undertaken in the initial stages of decay.

No dental service demands greater patience or more sympathetic understanding than does children's dental service. Along with recent professional developments we have come to a fuller realization of our duty towards our young patients. Through a genuine interest our child patients are in turn appreciating our efforts in a more complete manner.

It is true that at times the problem confronting us seems overwhelming, but we realize that there is no better way of cultivating confidence in ourselves than to succeed with a task which at first seemed impossible. If we but face the issue squarely, the end results will show that our efforts have been well worth while.

Our school experience leads us to affirm emphatically that the successful handling of children is not to be considered as one of dentistry's unattainable peaks. The school dentist concerned with the child's best interests and the pupil with confidence in his dentist's ability can do most commendable team work. With a proper understanding both may traverse the uplands of high efficiency and avoid the valley of dental inefficiency.

The Educational Phase.

The early detection of dental disease is a good and necessary thing. The avoidance of focal infection through early remedial attention is a commendable and sound procedure. In the fight in which we are engaged, however, the combat with dental caries, neither of these things is the fundamental consideration after all. The actual prevention of dental disease is the objective that we must have more and more in view, and modern research depicts with an ever-increasing clearness the path to such an attainment.

Broadly considered, dental caries might be claimed to be a disease which is the complex result of our modern civilization. Carbohydrate foodstuffs find lodgment on the teeth and are converted into acids. In protected places on the teeth, where the acid can become sufficiently concentrated, it will attack the tooth substance and there occurs the typical cavity popularly known as decay.

The almost universality of the disease is now a well known fact, even to the lay mind, but the means to be taken to combat the condition effectively are far from being so well recognized and here lies the profession's supreme opportunity. Dental diseases are preventible in direct ratio to the knowledge of their causes which the public possess and of the measures of prevention which they practise.

Unfortunately for a long time the public has received a large portion of its dental knowledge through mercantile advertising. Manufacturers of tooth pastes, mouth washes and tooth brushes have endeavoured to educate the public in matters pertaining to oral health by conspicuously printed articles which advertise their products. Readers are informed by the manufacturers of the virtues and superior usefulness of these, in spite of the fact that research may have proved their inaccuracy in many cases. Manufacturers of tooth brushes have claimed all the virtues possible for their products, regardless of size and shape. There are some widely advertised brushes which are so incorrectly constructed that it is quite impossible to cleanse all the surfaces of the teeth properly by their aid and yet their sale is large.

"Pyorrhœa cures" also abound, the claims of which cannot be substantiated. Obviously the effect of all this is not altogether beneficial. The duty of educating the public is preeminently a professional one, but in the past it must be admitted that the dental profession has been lamentably weak in its attitude towards the matter.

It makes little difference how skilful the professional service rendered in the dental surgery may be; its value is very slight unless it is followed up by systematic home prophylaxis. This must be instilled in the mind of the patient with the same care and accuracy that the child is taught its first lesson in mathematics.

In meeting pressing demands for treatment, the general tendency is to neglect this phase of our professional obligation. It must be understood, too, that a mere passing reference to the matter is of little avail. Impressions that are to exist in the mind must be deeply impressed on the consciousness of the individual. Hence, if the habit of correct oral hygiene is to be permanently fixed in the mind of the patient, it can be done only through forceful argument and careful teaching persistently applied. Simply telling the patient to brush the teeth with an up and down rotary movement of the brush will not suffice. The instruction must be vigorous, definite and authoritative. Otherwise the patient will forget and lose interest in about the same length of time that it takes to give such instruction and he will continue to care for the mouth in the old careless way which is but little better than no effort at all.

Oral cleanliness is a first consideration in dental preventive treatment. In some quarters it is sometimes claimed that its importance has been magnified through the teachings of those who so enthusiastically advocate its extension as the panacea for all oral ills. No doubt its claims may sometimes have been exaggerated, but it must be admitted, I think, that, all things being equal, clean, wholesome mouths reduce susceptibility to dental caries.

An examination of the accumulated bacterial growth in the mouth will show that it is very great in the morning and a correct application of hygienic measures will reduce the growth to a minimum. In

six hours the growth will be recurrent to a considerable degree, but, owing to the activity of the mouth, not so much harm is done by the accumulation during the day. Still, whenever it is possible to do so, it will be found that it is a distinct benefit to remove what has accumulated between morning and noon. Even a vigorous rinsing of the mouth with plain water at this time will prove helpful, especially in those cases where the physical conditions of the oral secretions are such as will favour the ready lodgment of food *débris*.

The patient who will effectively remove the accumulated growth from the teeth the first thing on rising and the last thing before retiring for the day, inserting the bristles of the brush between the teeth under pressure, so that the interdental surfaces of the teeth are polished bright and clean and at the same time brings pressure to bear on the gum margins, will by his own efforts make a valuable contribution towards the attainment of future freedom from dental ills.

The removal of food *débris* may be accomplished with reasonable thoroughness by brushing the teeth with scientifically approved agents, but statements advertising this or that dentifrice as capable of reducing the number of organisms in the mouth by 80% or 90% are obviously fallacious. The essential oils which are used to flavour tooth pastes may impart sufficient bactericidal action to the preparation as to have an inhibitive action on exceedingly delicate organisms, but to base even the most modest claim to antiseptic properties for any such preparation is entirely unjustified.

It cannot be too strongly emphasized that the value of the act of brushing the teeth lies more in the manner in which it is performed than in the particular dentifrice used in the performance of the act. The habitual and thorough cleansing of the teeth, the use of foods which help to keep the teeth clean and stimulate the salivary glands to activity, and periodical professional supervision are all helpful means of improving present and avoiding future dental trouble.

From the broad point of view of prevention as well as cure, their advocacy and practice deserve the highest commendation, but anyone who gives thought to the subject and who is familiar with modern research in the field of nutrition, must come to the conclusion that valuable as are such measures for the welfare of the children of the present day, utilized alone they fall short of being a comprehensive programme from the standpoint of the race and the nation, because they ignore the developmental factor which is the very root of the evil.

Should facilities permit it, the most logical and far-seeing policy to adopt would be to inquire into the cause of the poor quality teeth of the present generation and endeavour to evolve measures which will result in the creation of a dental mechanism possessing its own natural barriers of defence which will in a large measure free the next generation from the defects from which we are now suffering.

The proper conduct of such a study has a wide range and needs detailed inquiry of many kinds, historical, physiological, anatomical, bacteriological and biochemical.

Reference has been made to the unfailing regularity with which we encounter pronounced developmental fissure defects in the six-year molar teeth. These fissure defects are not to be confused with grooves. They are structural imperfections in the tooth by which the developing islands of calcification beginning at the tops of the cusps, have failed to unite properly on approaching each other, leaving a complete cleft in the enamel. They are present in quite two-thirds of the posterior teeth we examine and they are of such depth as to be absolutely non-cleansing and their arrangement is such that no technique of brushing can reach to and cleanse their depths. To prevent the natural occurrence of such areas of susceptibility would be an epoch-making accomplishment.

To do it we must, I think, focus our attention on the forces influencing tooth calcification, thinking of the fissure defect in terms of the prenatal and lactation periods. There is possibly no problem in the science of dentistry that is calling for more investigation by research workers at the present time than this.

While it is true that in certain mouths caries will not supervene even when the teeth are obviously ill-developed and badly calcified, the environment being favourable to prevent it, and true also that very finely developed teeth of excellent structure will sometimes decay freely in other mouths, the environment being unfavourable, still it must be allowed that generally speaking the perfectly formed, perfectly calcified tooth will resist caries better than the poorly formed and imperfectly calcified one. The means of bringing about a perfect calcification is a problem of metabolism which offers rich rewards in research. It is a problem not of dentistry alone, but of medicine and really of science in general.

It is generally known, I think, that the development of the six-year molars, as well as the deciduous teeth, commences long before birth and hence it is largely in the pre-natal period that we have not only our first, but perhaps our greatest opportunity for insuring and safeguarding mouth health.

Thus development has much to do with the question of susceptibility to dental caries and what is superlatively important in the whole matter is the question of food, both in form and content, especially during the critical periods of tooth development.

Some of the noteworthy contributions of twentieth century science have to do with the influence on growth of nutrition. Perhaps no recent results of the investigations in the field of nutrition have been more striking than those establishing the existence of the accessory food factors or vitamins. That these unidentified dietary essentials exert widespread and important influences is shown by the definite pathological manifestations resulting from their absence in the food. It so happens, too, that

the best sources of most of the accessory food substances are fruits and vegetables which incidentally likewise afford the roughage which is indispensable for proper jaw and tooth development. It has been said that "our food has become refined beyond the limit of safety" and that "dietetically man should go back to the primitive to a greater extent than is now done."

Our observations show that this is especially true as far as the teeth are concerned. If the necessary substances are not ingested, there can be no perfect development of tissues, no perfect maintenance and no perfect functioning. Few, indeed, among the children we examine have perfectly formed jaws and teeth. The majority have jaws which are underdeveloped and the teeth are consequently often crowded and misplaced. The teeth themselves, too, are usually lacking in hardness and the condition of the oral secretions is regularly such as will favour the production of caries.

In our early inspections our aboriginal children had excellent teeth, but in latter years during which they have come under the influence of conditions of feeding similar to our own, they have lost their dental superiority. Facts like this support strongly the contention that the root cause of the present day prevalence of caries centres round diet and development.

Thus in all our advice to parents, collectively or individually, it cannot be too strongly emphasized that the constitution of the jaws and teeth is determined largely before birth and that it is then most pressing that such efforts as are possible should be made as will tend to insure good dental development. In intrauterine life it is necessary from a dental point of view that the mother should receive through her diet an adequate supply of vitamins and mineral salts and the same is true during lactation.

Owing to the fanciful dislikes of some people, foods which are rich in the vital elements are declined with decided regularity and it is the hardest job in the world to induce such folk to view with favour any advice in the matter of diet regulation.

History shows, I think, that in working any reform, the problem is not confined alone to the task of gaining sufficient knowledge to make the reform possible, but a further difficulty lies in inducing those for whom the reform is intended to take advantage of it. This is especially true of a matter of this nature. In our endeavours at educating the public along these lines, barriers repeatedly appear which make the problem of betterment in development appear almost insurmountable at times, but nevertheless we do feel that our efforts at public enlightenment have a definite value and if we apply ourselves to the task with that zeal and thoroughness that can be rightly expected of us, it is felt that the endeavour will tend towards a lessening of the number of poorly calcified teeth in coming generations and will eventually make possible amongst an ever-increasing section of our people, a

more perfect oral development and an improved standard of oral sanitation.

Taking into consideration all the pertinent facts, we cannot escape the conclusion that a large measure of prevention is within our grasp and if we are but able to translate some of the recent research into living doctrine and practice, a potent weapon will be added to the armaments of preventive dentistry.

Looking to the future of the nation, our dental health education has a definite value, the most noticeable evidence of which is the ever-increasing requests for attention. This increase is, of course, the very goal towards which we have been striving, yet as it is gained it brings with it the very vital problem as to how to meet all demands with a limited staff. The movement has long since developed a magnitude where present facilities cannot be expected to meet the issue. Despite the fact that through existing facilities provided by our school dental service a large extension of opportunity for dental treatment has been opened to our school population, there are yet very many people in our largely populated centres who, because they do not come within the scope of the financial provisions or because they have not yet entered school, are deprived of the benefits of that health-conserving type of dental treatment that is so urgently necessary.

It was originally hoped that the practising profession would meet the needs of this section of children, but experience shows that this hope has not materialized. Similar experiences have occurred elsewhere. Whilst this state of affairs exists, it cannot be claimed that school dentistry is functioning as effectively as its importance as a factor of the public health warrants and it does seem that the situation calls for further serious consideration.

In New Zealand and elsewhere, if the parents desire it, full operative care is taken of the children up to a certain age regardless of financial circumstances and it is becoming more and more felt that a more liberal provision for treatment should be included in our Queensland service. By providing this we shall bring a greater meed of success and equity to the application of the work. The idea that school dentistry injures the private practitioner is erroneous. It does not now or would not do so if extended. Rather is it an advantage to him, for the child grows up to an adult with the teeth formerly lost fully developed and with the habit of caring for the teeth in a proper way.

Whilst we lay claim to an enviable record of achievement, we look for greater accomplishments. The task of preventing dental disease and establishing and maintaining dental health is so gigantic that it challenges our best efforts. In the broad plan of child development an embracing scheme of dental service is of prime importance. True, something is being done, but more, immeasurably more, is clamouring to be done. The call for a bigger and more comprehensive service is insistent and we look with confidence to the time when conditions

and facilities will permit us to make such an embracing contribution of effort that a definite menace to normal juvenile development will be averted and a betterment of far-reaching consequence will occur in community health and in civic and national efficiency.

Reports of Cases.

CARCINOMA OF THE THYROID GLAND.

By H. M. MORAN, M.B. (Sydney), F.R.C.S. (Edinburgh),
Honorary Consultant for Radium, Royal Prince Alfred Hospital; Honorary Surgeon, Lewisham Hospital.

E.S. A FEMALE, married, consulted me on February 21, 1925, for a "swelling in the neck, palpitation and loss of weight." Eighteen months previously she had first noticed a swelling in the region of the thyroid gland and about the same time she was conscious of an increasing fatigue after the day's work. She had lost eight kilograms (eighteen pounds) weight in eighteen months. There was no history of previous illness. She had had two children which were healthy, and no miscarriage.

On examination she presented the classical symptoms of exophthalmic goitre. She was exceedingly nervous, her pulse rate was 128 per minute, a very noticeable tremor was seen in her hands. The eyes were prominent and gave both Stellwag's and von Graefe's signs. A tense swelling, somewhat hard and nodular, occupied the position of the right lobe of the thyroid gland. The left lobe was also large, but softer. She weighed just under forty-four kilograms (seven stone).

A diagnosis of exophthalmic goitre was made and on February 25, 1925, at Lewisham Hospital, I performed a partial thyroidectomy, removing the right lobe and isthmus under ether anaesthesia induced by Dr. C. King. The tissue removed was sent to Dr. C. Shearman who reported as follows:

Microscopically this is a papillary cystic carcinoma. The growth is of the papillary epithelial type met with in this organ. In places the acini show papillary ingrowths, in others the lumina are filled with masses of epithelial cells. Elsewhere there are formation of colloid and cystic changes.

I thereupon referred the patient to Dr. Molesworth for post-operative deep therapy. She was last seen by me on May 5, 1928, in excellent health and weighing 54.5 kilograms (eight stone nine pounds).

The following are Dr. Molesworth's notes on the patient:

On April 2, 1925, a dose of X rays was delivered to the left side of the neck; two hundred kilovolts were used with a filter of 75 millimetres of copper and one millimetre of aluminium, a port of entry fourteen by ten centimetres, fifteen milliamperes of current and an exposure of thirty minutes. On April 16, 1925, an application of X rays of the same nature as on the previous occasion was made to the right side of the neck. The only exception was that the port of entry measured ten by ten centimetres.

In both these exposures an endeavour was made to protect the larynx as far as was possible without allowing any glandular tissue to escape the radiation.

On April 30, 1925, the patient reported and had already improved wonderfully. The left lobe was at that date hardly enlarged at all and felt quite soft. The patient felt very much better and had put on 1.35 kilograms (three pounds) in weight. There was a moderate skin reaction over the whole irradiated area.

On June 17, 1925, the patient's sister reported that the improvement was maintained and that the patient had put on 9.45 kilograms (twenty-one pounds) in weight.

On March 16, 1927, the patient reported that she was quite well and on February 22, 1928, the patient was reported by Dr. Moran, who had seen her just previously, as being still quite well.

The manner of administration of the dose by the massive method has proved very successful in this case, but it is probable that an equally good result would have been achieved, as in other varieties of cancer, by the divided dose method which is now the rule in deep X ray treatment.

Amongst other advantages the risks arising from 10% to 25% increased sensibility to irradiation on the part of the patient, a state of affairs now generally recognized as being possible, are eliminated by spreading the total dose over two or three weeks in three or four fractions. In addition there is much less liability to provoke X ray sickness which may be of serious moment in a debilitated patient.

In dealing with patients with malignant disease I am firmly convinced that all means are to be employed where possible in the attempt to cure and not only should surgical measures be employed whenever possible and whenever they afford a reasonable prospect of cure, but radiation methods should be utilized as supplementary to the surgical treatment.

When surgical treatment is impracticable, radiation should always be given a trial unless widespread metastasis or extreme debility renders such intervention hopeless.

The difficulties and dangers which are very real in this means of treatment, are now largely eliminated by reason of the fact that accurate ionometric measurement is now available and the divided dose method allows of detection of undue reaction before the delivery of a full dose to a hypersensitive patient.

Comment.

The foregoing case illustrates some unusual points. First, it is an example of that rarer form of thyroid cancer which commences in the guise of a true exophthalmic goitre. The patient states positively that no tumour existed prior to eighteen months before the date of the first consultation. Thyroid cancer nearly always begins in a preexisting goitre. The type of goitre most likely to cancerize is the nodular variety. The unilocular cystic and the parenchymatous varieties rarely become malignant and, least of all, the fibrous.

The warning sign is a sudden increase in volume of an existing goitre. Such an increase may be due to hemorrhage into a cyst or to an added inflammatory process, but in both these latter conditions pain and tenderness are greater. Axiomatically one can say that every goitre in an adult which has suddenly begun to enlarge and in which hemorrhage and inflammation can be excluded, is malignant.

A second sign to seek is a change in consistency of the swelling; frequently the tumour becomes quite woody in its hardness. The onset of neuralgic pains is more often a late symptom. Such pains may radiate towards the back of the neck, the ear, the mandible or the teeth. Respiratory troubles are also late-comers, but dyspnoea always precedes dysphagia. Endocrine disturbances are inconstant, but signs of sympathetic pressure are sometimes evident. The early invasion of the corresponding lymphatic glands is rare, but when this "*adénopathie d'alarme*" does appear, the prognosis is very bad. This is a universal and an obvious truth, for when the first signal of any malignant growth is given by its metastases, the tendency towards generalization is great in proportion to the size of the primary growth.

Involvement of the recurrent laryngeal nerve depends less on the size of the growth than on the direction of local spread. In benign goitres involvement of the recurrent laryngeal nerve is always unilateral and does not occur in more than 15% of the cases. On the other hand, in cancer of the thyroid at full development the percentage in which the nerve is involved, is as high as 80 or 90 and bilateral involvement may occur. Symptoms of cerebral anemia may supervene from compression or obliteration of the vessels, but venous turgescence in the neck and face is much more frequent. Cachexia is little

marked, while the growth remains encapsuled. There is no anorexia, but the customary dislike of many cancer patients for meat foods is observed. Pulmonary metastases are so often discovered as to make a routine X ray examination of the chest essential. Cancer of the thyroid has a well known tendency to bone metastases, the skull, vertebrae, ribs, femur, humerus, tibia being affected in a descending order of frequency, but the symptoms of bone metastases are often submerged in the general suffering of the terminal stages.

A merciful death may result suddenly from cardiac syncope or from spasm of the glottis. More often the end comes from bronchopneumonia or asphyxia, rarely by slow degrees from cachexia. Acute cancer of the thyroid gland is a cancer of rapid onset giving rise to sudden grave symptoms, in many ways showing parallelism with acute medullary cancer of the breast and just as rapidly proceeding unchecked by any treatment.

The ideal treatment in a particular case can be determined only after close cooperation between the surgeon and the radiation therapist. Wherever complete ablation is possible surgical excision should be performed. But this should always be followed by thorough radiation of the whole area. When a board-like phlegmon exists and when large fixed glands are present, the radiotherapist may be able to prolong life and relieve suffering. But such radiation treatment should be undertaken in the presence of dyspnoea only by one experienced in such work who is alive to the possible development of a condition requiring immediate tracheotomy. When general metastases exist, such local treatment will not avail much, hence a preliminary radiograph is to be counselled before any extensive treatment.

Reviews.

DISCOVERIES IN MEDICINE.

MR BERNHARD J. STERN, Ph.D., has given us a most fascinating series of essays on the factors influencing medical progress which he has analysed from a logical and to some extent an objective point of view.¹ He is a sound psychologist and a philosopher of merit. His diction is usually good, although in places he has failed to revise his sentences with care. The plan on which he has built his book, is to examine the various factors tending to retard the acceptance of new doctrines, to consider the weight of the opposition to innovations and to scrutinize the sequence of events that have culminated in the actual discovery of each material doctrine in medicine. He starts out on safe grounds by assuming that vested interests are the most potent reasons for the refusal of a new doctrine. The vested interest may take the form of an emotional disinclination to discard a rooted conviction. The second factor is the power of tradition. The author speaks of the hostility to change that is often associated with a fear of unknown dangers lurking in new procedures. In the next place he regards the reverence for authority as a strong impediment to progress. All these factors are discussed in the abstract and dissected. In summing up the social factors interfering with progress he groups them into classes, psychological, cultural, mechanical and personal.

In a succession of chapters he applies his ideas and seeks support from other observers. Conservatism in medicine, the opposition to dissection, the opposition to Harvey's theory of the circulation of the blood, the reception of Auenbrugger's theory of percussion, the opposition to vaccination, the opposition to Oliver Wendell Holmes and Semmelweis, the opposition to Pasteur, the opposition to antiseptics and asepsis provide the author with fertile fields for exploration. In each he finds ample evidence in support of his views concerning the reasons why men refused to accept discoveries of importance and why the public at first regarded as cranks, impostors or

enthusiasts men whom a subsequent generation has raised to idols. He claims that in all his examples the psychological factors, "the tendency to suffuse an habitual mode of activity with an emotional tone that gives it an exaggerated value, and the persistence of habit reactions due to the difficulty of reconditioning behaviour patterns." The next common factor was social pressure. Fear and the tendency to avoid pain and unpleasantness contributed to the opposition to dissection and to vaccination and to the refusal to accept the doctrines of antiseptics and asepsis. Ignorance played a part in some instances, while vested interests were prominent in others. Mechanical difficulties induced some people to object to the adoption of percussion, dissection and vaccination, while the general application of aseptic surgery was delayed until facilities could be provided in modern hospitals. Lastly he finds that personality conflicts have loomed large in the history of several of the great discoveries of medicine.

In the second part of the book the author displays sound judgement in restricting the unlimited adulation of genius; he is fair and even generous in his recognition of the achievements of great men, but he proves that every one of the greatest discoveries was rendered not only possible, but actually inevitable by the gradual accumulation of knowledge on the particular subject involved. His list of multiple discoveries and inventions is at once illuminating and amazing. It is unnecessary to enter upon the contents of this interesting book in more detail. Those whose interest lies in the march of science, in the accumulation of knowledge and in the effective utilization of knowledge for the benefit of mankind, will find matter for consideration in each page of this admirable little book. It would be vain to assume that the book will appeal to the conservative medical practitioner or to the blind worshipper of medical heroes.

PROGRESS IN PÆDIATRICS.

The value of medical as of other summaries may be measured by the attraction offered by any particular section. Abt's pædiatrics digest is no exception to the rule.¹ The issue for 1927 is a book of some four hundred pages containing a few plates and much interesting matter. The editing is not of the best and the author's point is sometimes lost or obscured. Sections on infant feeding, nutritional disorders and infectious diseases take up more than one-third of the work. Mention is made of the influence of certified milk in the United States in lowering the incidence of diarrhoeal infections in infants by raising the standard of milk supply. American experience of injections of toxin-antitoxin mixture in active immunization against diphtheria is quoted. On the authority of William H. Park, it is stated that in one million injections of toxin-antitoxin in New York State, permanent harm has not resulted to any child. In the city, however, several deaths occurred through the use of a mixture which had not been sufficiently neutralized. In another case a number of children displayed local and constitutional symptoms after the injection of a mixture from phials whose contents had been frozen. Some of this material was found to contain free toxin.

In the section devoted to tuberculosis, a review is given of the work done by Calmette and his collaborators in the vaccination of forty-three thousand new-born children against the disease. The editors give their opinion that further well-controlled clinical observation is required before the method can be universally employed.

As an index to pædiatric literature the book is valuable.

¹ "Social Factors in Medical Progress," by Bernhard J. Stern, Ph.D.; New York: Columbia University Press. Royal 8vo., pp. 136. Price: \$2.25 net.

¹ "The Practical Medicine Series, Comprising Eight Volumes on the Year's Progress in Medicine and Surgery": Under the General Editorial Charge of Charles L. Mix, A.M., M.D.; Pædiatrics, Edited by Isaac A. Abt, M.D., with the collaboration of Arthur F. Abt, M.D.; 1928. Chicago: The Year Book Publishers. Crown 8vo., pp. 426, with illustrations. Price: \$2.25 net.

The Medical Journal of Australia

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Post-Graduate Training.

At its first annual meeting at Canberra in March, 1928, the College of Surgeons of Australasia held a discussion on post-graduate training. It was decided that a chair of surgery should be established and a professor of surgery should be appointed at each medical school, that a board of surgical studies should be constituted and that post-graduate training should be arranged in hospitals and universities to meet the necessary requirements. It was also suggested that the establishment of endowments and scholarships would render possible the training of efficient surgeons in sufficient numbers to carry out the surgical work of the community. The College of Surgeons of Australasia has as one of its avowed objects the arranging of "adequate post-graduate surgical training at universities and hospitals." It necessarily restricts its recommendations to the narrow limits of a branch, albeit an important branch, of medicine. These proposals can and should be considered, so that, if found suitable, they may be applied to medicine as a whole.

Before an attempt is made to determine whether these proposals are suitable, it is necessary to formulate the objects of post-graduate work and to define the limits of its application. The first object concerns the general practitioner who requires to refresh his memory of what he has learned in his earlier years and who needs to have the practical application of recent advances placed before him in such a way that he may apply them in his daily practice. Even though a man reads his journals and though he applies the written word to the best of his ability, his efforts will not be so successful as those of his *confrères* who, in addition to undertaking careful study, seek the advantages which are offered from available post-graduate classes. It is not necessary to reiterate the argu-

ments in favour of personal tuition of this nature. Another object is the provision of facilities for the general practitioner who desires to undertake advanced work of a general nature and who will require the use of special apparatus. Much of the apparatus required for his tuition is not available even at university or hospital; the post-graduate trainee should have access to any institution at which facilities for adequate teaching are provided. The third object of post-graduate work has to do with the general practitioner or senior hospital resident who has developed an interest in one branch of medical science, whose reading has been largely in one direction and who wishes to devote himself entirely to the practice of a specialty. The fourth object of post-graduate work covers a somewhat heterogeneous group. There are certain needs to be met in the arrangement of work for those who do not wish to undergo an intensive course of training, but who wish to gain an intelligent understanding of special subjects and of recent work. Under this heading may also be included the introduction to the profession from other centres of learning of men eminent in their several spheres who have definite messages to impart. It is thus clear that post-graduate work covers a wide field. It requires a creative body as its controlling force, one whose members have vision, determination and freedom of action.

The question naturally follows as to how far post-graduate work has succeeded in Australia. The Melbourne Permanent Committee for Post-Graduate Work was founded by the Victorian Branch of the British Medical Association. It has proved itself to be a highly efficient body, one capable of organizing refresher courses and special courses for those anxious to proceed to higher degrees. It has arranged courses during which medical practitioners have been able to go into residence in hospital in order to participate in the routine work of certain institutions. It has brought notable teachers from other countries who have given of their best to Australians. In other States post-graduate classes have been arranged by the Branches of the British Medical Association or by a university organization. Some of these have served a useful purpose and have been appreciated by those who attended them;

others have not been so successful, possibly owing to inexperience on the part of the organizers.

There are several methods by which post-graduate work can be organized and controlled. The first is by the Branch of the British Medical Association with university collaboration, the second is by university control and the third is by a committee acting with the cooperation of various bodies—universities, teaching hospitals, research institutions and so on. The third method is the one which is most likely to give satisfactory results and which is exemplified in the Melbourne Permanent Committee for Post-Graduate Work. University control would not be satisfactory; the body in charge must be in actual contact with medical practice, that it may sense the needs of medical practitioners and experience has shown that organization in these circumstances might be delegated to non-medical persons with unsatisfactory results. The machinery of the Branches of the British Medical Association is not as a rule well adapted to the control of teaching, but it can be used with advantage to institute the organizing body and the Branches should have representation on the body or committee. Such a committee would take the place of the board of studies suggested by the College of Surgeons of Australasia. It would be foolish to discard a system which has been carried on with such signal success.

Current Comment.

IMMUNITY TO SYPHILIS.

It has been taught for many years that an attack of syphilis protects the victim from another. The immunity afforded by an infection, however, was held to be dependent on the persistence of that infection, for it appeared that when complete cure followed treatment, a second infection occasionally took place. Hutchinson maintained that when a second infection occurred, it was characterized by a soft or abortive chancre. The observation of Colles is that a healthy woman becoming impregnated by a syphilitic male and bearing a syphilitic child, may remain free from all manifestations of the disease. It has been assumed that the mother is immunized at conception and is in consequence incapable of further infection. Moreover, it has been recorded many years ago that these allegedly immune mothers have at a later date suffered from

tertiary manifestations of syphilis. This implies that the infection in Colles's phenomenon is a latent one and that the resistance to further infection is a partial immunity. In more recent years attempts have been made to determine more exactly the conditions under which a syphilitic individual may acquire a second infection and to interpret the protection afforded by one attack in terms of immunity. Landsteiner and Finger found that it was possible to reinfect persons with secondary and tertiary syphilis by introducing syphilitic material into skin pockets. In the early part of the present century the study of this subject was furthered by experimental work on apes and later on rabbits. Some help was gained by observations in connexion with other protozoal diseases, particularly those caused by piroplasmata and by trypanosomes. Seitz, writing in 1910, came to the conclusion from the data available at that time that the immunity to syphilis is not a real immunity, but a partial and local immunity. It is characterized by an increase in resistance on the part of the mucous membranes to the syphilitic virus. The work by Roux and Metschnikoff on the parasiticidal action of the serum of apes treated with the serum of infected persons is too well known to need description. That further information is likely to prove of practical importance is evident in view of the fact that the desirability of an effective sterilization of the infected organism must to some extent depend on the degree of protection existing while the body harbours the spirochaetes. The human race is highly susceptible to the infection and there is little evidence at present of any race immunity. Should it be found that the partial immunity disappears with cure, it would be anticipated that the spread of the disease in the community would increase, for those who contract the disease once and have the good fortune to be cured, would be more careless in regard to the chances of a further infection than other people.

An admirable summary of the recent work connected with the form of immunity to syphilis, relapsing fever and trypanosomiasis has recently been published by E. S. Heronimus.¹ He refers to the hypothesis built up within the past few years on a form of immunity spoken of as non-sterilizing immunity. He claims that this form is characteristic of the trypanosome infections and of syphilis. Kolle, while experimenting with rabbits, found that it was possible to produce a syphilitic superinfection if the second inoculation was carried out before the sixtieth day after the first infection. If the second inoculation was made later than this date, no superinfection resulted. It was, however, proved by Pearce and Brown that under favourable conditions a superinfection could be effected while the rabbit harboured spirochaetes. The question has been raised whether the protection afforded by a spirochaetal infection is active for the same strain only, or whether it holds good for all strains of *Spirochæta pallida*. Kolle has expressed the view

¹ *Seuchenbekämpfung*, Heft 3, 1928.

that since superinfection in man is so extremely rare there must be a panimmunity in the human race. Pearce and Brown were the first to demonstrate the fallacy of this argument. If a rabbit is infected in the ordinary manner, it can be shown that the spirochaetes remain alive and virulent for a very long time, especially in the lymphatic glands. Moreover, it was Kolle who demonstrated that when inoculations of syphilitic material into rabbits failed to induce signs of the disease, the regional lymphatic glands contained spirochaetes in an active state and an infection could be produced in other rabbits by injection of the glands. There is a considerable amount of evidence now available in support of the contention that the immunity responsible for the failure to produce manifest superinfection is merely a local phenomenon. This is called chancre immunity.

Heronimus draws attention to the behaviour of the three forms of protozoal infections to which reference has been made above. The trypanosomes are intensely virulent. There is a tendency towards remissions in treated infections. During the remissions some degree of immunity is evident, since acute exacerbations rarely occur. He interprets the phenomena observed by postulating a humoral immunity. The spirochaetes of relapsing fever are less virulent and there is a tendency towards a chronic form of blood infection. The immunity takes the form of a strong humoral immunity during the remissions. In syphilitic infections the spirochaetes do not produce acute blood infections and the immunity encountered is a local tissue immunity. By analogy it appears that if a parasite can be induced to live in harmony with the cells of the host, it is impossible to produce an acute infection by further inoculation. Heronimus puts forward this explanation for the observed fact that superinfections in trypanosomiasis and relapsing fever during the chronic stages are impossible. The failure is not due to an immunity, but to an induced condition of the tissue cells of a kind of insusceptibility. On the other hand the failure of superinfection in syphilis, according to this author, would also be referable to the conduct of the tissue cells and not to the presence of immunological antibodies.

The evidence that second infections occasionally occur in man after thorough early treatment of syphilis followed by presumable cure cannot be denied. If Heronimus is correct that this means a restoration of the susceptibility of the mucous membranes, it would be difficult to understand how superinfection in rabbits and even in man could occur. It must be conceded that when a syphilitic person exposes himself to infection and no fresh manifestations occur, the local immunity may be strong enough to prevent a mass infection. But it is conceivable that some degree of superinfection does take place. The primary lesion and the secondary rash are absent, not because the mucous membranes are insusceptible to further invasion, but because the immune bodies are sufficiently developed to inhibit this effect. The phenomenon of

Colles may be cited in support of this explanation. If this takes place it would be possible for a person to harbour two distinct strains of spirochaetes, both of which could give rise to tertiary and late tertiary lesions, notwithstanding the fact that the second infection was followed by no manifestations. Unfortunately the activity of the local immunity does not appear to be strong enough to render it of use in producing a passive immunity. Numerous experiments of this nature have been carried out, but the results have been discouraging.

ALLERGY.

The doctrine of allergy is put forward by many American and some British clinicians as the fundamental factor in certain diseases, such as asthma, hay fever, angio-neurotic oedema and urticaria. No one can deny that certain forms of these diseases are caused by the toxic effect of pollens, proteins, gases and other chemical bodies on hypersensitive mucosal cells. That these substances do not cause reactions in normal persons is also admitted. It is, however, not sufficient to explain that the subjects are hypersensitive to the proteins and other bodies, for there must be some effective cause for the allergic condition. Hitherto allergy is held to be a spontaneous state of hypersensibility, as opposed to anaphylaxis which is the condition produced as a reaction to the absorption of a small amount of a foreign protein. A. Sterling has endeavoured to advance the knowledge concerning the treatment of the allergic diseases by studying the possible methods of desensitization.¹ He has noted that while protein hypersensitiveness is present in a varying proportion of asthmatic, hay fever and perennial rhinitis patients, the majority of these persons can be improved by the exhibition of calcium salts. He examined the calcium content of the blood of eighty-five patients, but found in the majority the content was either normal or raised above normal. On the other hand sixty-eight of the eighty-five patients manifested a deficiency of phosphorus in their blood. Following the indication given by these estimations, he has administered acid phosphate of potash or other phosphorus compound and claims to have produced "a spectacular improvement." He refers to the findings of Howland that an excess of calcium impairs phosphorus retention, while an excess of phosphorus is unfavourable to calcium absorption. He suggests that phosphorus and calcium may act as activators for the enzymic activity of the blood, presumably as certain phosphorus compounds act as coenzymes in yeast fermentation. There is, however, little evidence that blood ferments act as proteolytic agents and that in the allergic state this action is impaired. The action of phosphorus may be of importance in this respect. We suggest that in allergy the surface tension of the mucosal cells may be altered and that phosphorus may tend to restore the cells to a normal condition.

¹The Journal of Laboratory and Clinical Medicine, August, 1928.

Abstracts from Current Medical Literature.

MEDICINE.

Fuso-Spirochaetal Diseases of the Lungs.

UNDER the caption of fuso-spirochaetal disease of the lungs David T. Smith (*Tubercle*, June, 1928) describes a group of suppurative infections of the lungs, the causal organisms being apparently fusiform bacilli and spirochaetes acting in symbiosis. Most pulmonary abscesses, pulmonary gangrene, certain types of unresolved pneumonia and some forms of bronchitis and bronchiectasis are, he asserts, different manifestations of infection with this group of anaerobic organisms. The disease is widespread and is usually mistaken for tuberculosis from which it may be distinguished by the foul breath and sputum, chocolate-coloured haemoptyses and the absence of tubercle bacilli from the sputum. A skiagram is of doubtful value unless a "Lipiodol" injection has been made beforehand. The diagnosis is clinched by the finding in the washed sputum of anaerobic organisms, notably spirochaetes, fusiform bacilli, vibrios and anaerobic cocci. Similar organisms are present in the gums of patients suffering from pyorrhoea and it is probable that this is the most common source of the infection. The author has produced pulmonary abscesses in laboratory animals by injecting sputum from patients suffering from pulmonary abscess and has recovered the same organisms from the tissues of the animals after death. For the treatment of the disease he states that rest in bed and postural drainage are essential. The exhibition of arsenical preparations is useful in the early stages, before dense fibrosis has occurred. Surgical drainage externally will cure a percentage of resistant infections. Proper oral hygiene is the most important factor in preventing the disease.

Apical Râles in Pulmonary Tuberculosis.

RANDALL CLIFFORD (*New England Journal of Medicine*, June 21, 1928) discusses the interpretation and the significance of persistent fine apical râles in pulmonary tuberculosis. They are often found, he asserts, in patients with healed tuberculosis and persist over a period of many years. The manner of production of these râles must be different to that of those occurring in active disease, where moisture in the finer bronchial tubes is the essential factor. In Clifford's opinion they are due in many instances to collapse of the lung lobules. He gives the case notes of six patients who had been observed for periods of from three to fourteen years. During this time definite râles had been constantly heard at a lung apex, yet the patients had either continued at their work or undergone surgical operations without any reactivation

of their apparently healed tuberculous lesion. He concludes, therefore, that persistent apical râles alone do not warrant a diagnosis of active pulmonary tuberculosis and that in judging activity in this disease symptoms are of cardinal importance.

Artificial Pneumothorax in the Treatment of Pulmonary Tuberculosis.

F. CARDIS (*Revue de la Tuberculose*, April, 1928) discusses from a statistical point of view the contention that artificial pneumothorax should be carried out as a routine measure whenever possible and as soon as possible in the treatment of patients with pulmonary tuberculosis. The arguments advanced against any delay in carrying out this procedure in suitable cases are two in number: (i) There is a risk of pleural adhesions forming, preventing satisfactory collapse at a later date; (ii) the lesion may become bilateral. In an endeavour to decide if it was justifiable to temporize, the author has analysed the statistics of 126 of his patients in whom artificial pneumothorax was indicated. In 15 of these no collapse was obtainable; the average duration of their illness was 39 months. Thirty-six patients had the diseased lung completely collapsed, with an average duration of nineteen months' illness. Collapse was almost complete in 49, averaging 33 months, while only partial pneumothorax was obtained in 26 patients, the period of whose illness averaged 18 months. It was noticeable that of the 15 patients in whom the treatment failed, 11 had a history of previous pleurisy and the author maintains, therefore, that this complication, rather than the duration of the illness, is the chief cause of the failure of collapse-therapy. To the sanatorium physician, to whom his study is addressed, he offers the following as a safe rule: The patient should be watched closely for the first six months and if at the end of this time there is no evidence of very distinct improvement, recourse should be had to collapse-therapy. During this observation period, of course, certain incidents, such as an acute exacerbation in the affected lung, a severe haemoptysis or a pleurisy particularly, would make it advisable to perform artificial pneumothorax without further delay. But the figures given justify, he maintains, an expectant attitude rather than immediate interference.

C. FRIMONT-MÖLLER (*Indian Medical Gazette*, May, 1928) has published the results of seven years' experience of treatment by artificial pneumothorax in his sanatorium. The number of patients so treated was 306. Of these 124 were given insufflations for less than six months and only 7% became clinically well. Of the 92 patients treated for more than six months 35 had a partial and 57 a complete pneumothorax. Of the latter 58% became clinically well. Of the patients with partial pneumothorax only 23% are in good health. The duration of the treatment was in no instance longer than three years and over two

years in six cases only, yet a large number (44.5%) of patients are alive and at work even six years after treatment. No instances of sudden death are reported in over four thousand insufflations and in only two patients were any alarming symptoms noted.

Angina Pectoris.

R. O. MOON (*The Practitioner*, April, 1928) has described the symptoms and aetiology of *angina pectoris* and discussed its treatment. Substernal oppression or constriction is the most definite symptom. The coronary arteries and the aorta are the sites to which the symptom is ascribed. Heredity, high blood pressure, syphilis, rheumatism, gout, alcohol and tobacco are aetiological factors. Administration of amyl nitrite is the best treatment for the attack, sometimes followed by *spiritus ammoniac aromaticus*. If no relief is obtained, at least fifteen milligrammes (one-quarter of a grain) of morphine are advised; the patient generally prefers to stand or sit and he should not be encouraged to lie down. Hot bottles to the feet and heat to the praecordia, epigastrium or between the shoulders may do good. Heavy meals should be avoided and vegetables should largely replace meat. Little alcohol should be allowed and tobacco rigorously excluded, as it has a very prejudicial effect in *angina pectoris*. Rest in bed for a few weeks may do good, but as a rule mild exercise is allowed, providing it is in moderation and that all hurrying is avoided and stairs mounted with caution. Walking up hill against the wind or soon after a meal is prohibited. A quiet mental and physical existence is indicated. Bromide of ammonia 1.0 to 1.3 grammes (fifteen to twenty grains) three times a day is useful in nervous or irritable subjects. Warm clothing should be worn. Iodides, especially sodium iodide, are the most useful drugs. Sodium nitrite 0.06 gramme (one grain) with potassium nitrate 0.6 gramme (ten grains) is a useful combination. Erythrol tetranitrate 0.03 gramme (half a grain) three times a day is better for permanent use. When attacks are frequent, theobromine 0.3 gramme (five grains) taken three times a day is more effective than any other drug.

"Plasmochin" in Malaria.

O. J. BROSINS in the Sixteenth Annual Report of the Medical Department of the United Fruit Company, 1927, records some results of treating malaria with "Plasmochin," a synthetic quinoline derivative. Sixty patients with tertian and aestivo-autumnal malaria were treated with 0.06 gramme of "Plasmochin" every day, the blood became free of parasites generally on the fourth or fifth day. Several relapses occurred and blackwater fever developed in three instances. Cyanosis, nausea and severe headaches were toxic symptoms attributed to "Plasmochin" in a few instances, necessitating substitution of quinine. Eighteen patients with tertian malaria were treated with

larger doses of "Plasmochin," 0.08 gramme every day with no better results than with smaller doses. Twenty-five tertian patients were given "Plasmochin," 0.06 gramme, and quinine, one gramme, every day. Recovery was uneventful except in two instances; one patient had parasites in the blood on the sixteenth day after several normal findings, the other died on the day of admission. Forty æstivo-autumnal patients recovered quickly on 0.06 gramme of "Plasmochin" and 0.75 gramme of quinine every day. Four recurrences were noted within a few days and in three instances vomiting and gastric pains occurred. Twenty-eight æstivo-autumnal patients on 0.06 gramme of "Plasmochin" and one gramme of quinine every day gave normal blood findings generally on the fifth or sixth day; one death occurred on the fourth day and nausea caused omission of "Plasmochin" on the eighth day in another case. Forty patients, mainly with æstivo-autumnal malaria, were treated for three days with quinine before "Plasmochin" plus quinine was given; the majority cleared in three to ten days. All the above were treated in hospital. One hundred and twenty malarial subjects were treated as out-patients; 0.04 to 0.06 gramme of "Plasmochin" and one to two grammes of quinine were given every day for four days each week. The blood was examined in a thick film at the end of each week; in all except twenty instances the blood was free of malaria parasites at this first examination. Treatment was continued on these lines for four weeks and of seventy patients examined at the end of this period none was found with parasites in the blood. Seventeen of the 385 patients examined were admitted to hospital for other complaints within eight months and in no case were malarial parasites found in the blood. The conclusion is reached that the best treatment for all types of malaria is "Plasmochin" 0.06 gramme and quinine two grammes every day, divided into three or four doses for four or five days. The blood should then be examined every day for several days and treatment continued according to the results of blood examinations. In the cases discussed "Plasmochin" compound tablets ("Plasmochin" 0.01 gramme and quinine sulphate 0.125 gramme) were mainly employed.

Sputum in Asthma.

I. CHANDLER WALKER AND JUNE ATKINSON (*Archives of Internal Medicine*, April 15, 1928) have recorded the results of bacteriological examination of 724 specimens of sputum from as many patients over a period of ten years. These patients suffered from asthmatic bronchitis during autumn, winter and spring, they were regarded as non-sensitive asthmatics. Streptococci very largely predominated; they were divided into hæmolytic and non-hæmolytic and further subdivided into eight groups according to their ability to ferment salicin, mannite and lactose in litmus serum media. The sputum was washed in sterile

sodium chloride solution, shaken up with five cubic centimetres of plain bouillon and tubes of melted plain agar with 0.5 cubic centimetre of sterile defibrinated blood were inoculated with the plain bouillon emulsion poured into Petri dishes and incubated for thirty-six hours. It was found that the prevalence of hæmolytic and non-hæmolytic streptococci varied from year to year, but did not vary during the cool period of the year, though changes in prevalence occurred in the summer. Eight varieties of streptococci were recovered, named according to Holman's classification; different varieties predominated in different years, the hæmolyticus *subacidus*, *anginesus*, *infrequens* and *pyogenes* being most frequent. The non-hæmolytic streptococci commonly found were the *ignavus*, *salivarius*, *fecalis*, *mitis* and the non-hæmolytic Type 1. Apart from the *Staphylococcus pyogenes aureus* other bacteria than streptococci were not prevalent in the specimens in sufficient numbers to be comparable to the streptococcus group.

Osteomalacia.

V. B. GREEN-ARMYtage (*Indian Medical Gazette*, July, 1928) discusses the early recognition, prevention and treatment of osteomalacia in India. He states that variations in the blood calcium and phosphorus depend directly upon the severity of the disease. Osteomalacia may occur at puberty and resemble late rickets or it may occur in any woman at any time, the most usual period being during lactation or during the third or fourth pregnancy. In sixty-nine patients followed up for three years the menses were scanty and irregular. Improving the diet was not a satisfactory mode of treatment in India, as often diet depended on the prejudices of a thousand years. Osteomalacia is a deficiency disease, probably due to the absence of fat soluble vitamins A and D; the ovaries play no part in its causation. Radiographs revealed decalcification, blurred outline or typical bony deformity of pelvis, sternum, vertebrae or long bones. Common symptoms were tetany, exaggerated knee jerks, paralysis of extremities, abdominal distension, indigestion, anæmia, girdle pains and joint pains; the latter caused difficulty in walking. The cause was in the diet and lack of sunlight; vegetables and fresh milk were often unobtainable and the *pardah* restrictions caused women to live on wheat bread, ghee, dal, boiled milk and cooked vegetables. Meat, fish and eggs were forbidden, they lived huddled together in cities and saw no sunlight. Thirty cubic centimetres (one ounce) of cod liver oil given twice a day and plenty of sunlight are the necessary factors for treatment. Intravenous injections of sodium morrhuate twice a week, one to six cubic centimetres, gave excellent results and irradiated cholesterol 0.6 mil in four cubic centimetres (ten minims in two fluid drachms) of liquid paraffin twice a day in addition to cod liver oil was helpful in resist-

ant cases. In one hospital in Bengal twenty-six craniotomy operations and fifteen Cæsarean sections were carried out on account of osteomalacia among 2,870 pregnant women during the last thirty months.

Chronic Spinal Muscular Atrophy.

O. MARRBURG (*Wiener Medizinische Wochenschrift*, July 7, 1928) discusses the ætiology of various chronic progressive muscular atrophies of spinal origin. Excluding those following amyotrophic lateral sclerosis and syringomyelia, he divides them into three groups. The first or syphilitic group is seen with *tabes dorsalis*. It is not a primary degeneration due to disease of the horns of the spinal cord, but secondary to meningeal infections of the dorsal root fibres. These conditions react very poorly to specific treatment. The second group is caused by some toxic disease such as malaria or a severe angina with a superimposed gastro-intestinal infection. The area involved in the cord is not sharply defined and the lesion may take the form of a Landry's paralysis. Finally some conditions can be classified as senile or arteriosclerotic. There is no close association of spinal involvement with the degree of thickening of the ventral spinal artery. Probably the condition leaves the cord more open to further infection from some source similar to those mentioned in the previous group.

Angio-neurotic Oedema and Urticaria.

F. R. MENAGH (*Journal of the American Medical Association*, March 23, 1928) has tabulated the results of treatment of 260 patients suffering from angio-neurotic oedema and urticaria. The patients were classified into two main groups. In the first there was an entire absence of disorder of the biliary tract and the ætiological factor was the absorption of food or other foreign protein. In the second group, comprising 48%, biliary tract disease was the only ætiological factor. Treatment was directed towards improving the condition of the biliary tract when this was involved and towards the removal of active foreign proteins, whenever proteins were responsible for the symptoms. The author is of opinion that in searching for the ætiology of angio-neurotic oedema and urticaria it is therefore necessary to consider absorption from the biliary tract as a possible cause in addition to the usual foreign proteins. All the patients were tested for protein hypersensitivity by the ordinary skin tests. Since biliary absorption seemed to play so important a part, it appeared probable that the source of the responsible protein might be found in the bacteria present in the biliary tract. In the patients with biliary disorders, of whom there were 129, sterile trans-duodenal drainage was performed in 97 instances and cultures were procured from 81 or 83.5% of the specimens of material so obtained. Auto-genous vaccines were prepared from 75 specimens or 77.3%. Of these vac-

cines 10 were not tested, 10 (13.3%) caused no reaction and 55 (73.3%) gave rise to reactions. In each of these cases at least two other vaccines and the solutions in which the organisms were suspended, were used as controls. The organisms recovered included *Streptococcus viridans*, *Staphylococcus albus*, *Staphylococcus aureus*, *Micrococcus catarrhalis*, colon bacillus and a hemolytic streptococcus.

Heliotherapy in Tuberculosis.

C. R. Howson (*California and Western Medicine*, July, 1928) states that heliotherapy has been popularized by Rollier's results in the Swiss Alps. The baths increase metabolism and produce euphoria; there is great vasomotor stimulation. The skin becomes smooth and velvety and the muscular development, even without exercise, seems to improve. The ultra-violet rays whose therapeutic importance seems to have long held the centre of the stage to the exclusion of the rest of the spectrum, comprise only about one-millionth part of the sunlight; under cloudy or dusty atmospheric conditions very few of them reach the earth. They have small penetrative powers, probably not reaching below the skin. The tanning of the skin produced by sunlight may be regarded as a protective mechanism and patients seem to benefit by the exposures in approximate proportion to the amount of pigment developed. For proper treatment by heliotherapy the exposures must initially be of brief duration. Howson gives full details as to the methods of exposure which commences at the feet, and only after careful observation is made to include the chest and the rest of the body. Little is known as to the precise value of the various rays of the spectrum; it is certain that other rays besides the ultra-violet are of value and the best results seem to follow the use of the entire spectrum. The best artificial light is that of which the rays most closely resemble those of sunlight. Air baths are a most necessary adjunct to heliotherapy and are too often neglected. They can be used in the absence of sunlight and produce valuable vasomotor stimulation. Many blondes can never benefit by sun baths; they simply burn and peel and experience unfavourable general reactions. Such persons, however, may derive great good from air baths. Heliotherapy used in pulmonary tuberculosis may produce focal reactions similar to those caused by tuberculin, no matter what part of the body be exposed to light; to avoid these reactions anything approaching sunburn should be carefully avoided. A transient erythema of a few minutes' duration is normal, but reddening of the skin lasting more than twelve hours is a burn and the baths should cease till it subsides. Fatigue, weakness, pyrexia, hæmoptysis also mean that the patient has had too much sun, though air baths may be continued with beneficial results. Heliotherapy is contraindicated in all acute tuberculous states, in all chronic types with much fever, in persons liable to sunburn and in the aged. It

is indicated for the treatment of the chronic stages of tuberculosis, especially if extrapulmonary, with the exception of bilateral renal infections.

General Paralysis.

H. HERSCHMANN (*Wiener Medizinische Wochenschrift*, July 28, 1928) has analysed the records of the number of general paralytics in Vienna before and since the war in order to see whether "Salvarsan" and malarial treatment have made any difference. From his figures it is evident that the percentage of male patients has decreased by 11.6%, while for females there has been an increase of 9.8%. The combined figures show a decrease of 8%. He quotes figures to prove that malarial treatment offers a 50% better prognosis for men than women. This is partly due to early and energetic treatment. As the man is generally the main support of the family, he comes under treatment whenever his capacity for work is diminished and is content to remain under care until he can resume work of some sort. With females, however, the disease is not diagnosed nor treated in the early stages and many women leave hospital too soon because their absence from home causes much domestic trouble.

Blood Sugar Estimations in Tabes Dorsalis.

F. HALPERN and H. KOGERER (*Wiener Medizinische Wochenschrift*, July 7, 1928) have investigated the statement of Wagner-Jauregg that the painful crises of *tabes dorsalis* are influenced by a high sugar diet which apparently produces toxic effects. They have tried "Insulin" injections after noting the effects of "Insulin" on forms of vomiting. Thirty patients with *tabes dorsalis* who suffered from gastric and other crises and sixteen without any definite attacks were investigated. Blood sugar levels of the first group lay between 0.105 and 0.135 in contrast to 0.09 to 0.116 for the latter group. From this it would appear that patients without painful attacks have a practically normal blood sugar curve. Fourteen patients with lightning pains were treated with "Insulin." Twelve patients improved after one or more doses of five to eight units and cessation of the attacks was noted. Four of them had gastric crises and success was obtained with three. After "Insulin" treatment the blood sugar level dropped to 0.84 to 0.11. They consider that further investigation of this action of "Insulin" is indicated.

Congenital Syphilis.

K. HOCHSINGER (*Wiener Medizinische Wochenschrift*, May 5, 1928) declares that congenital syphilis can occur without infection of the mother in a certain number of instances. Naturally any mother giving positive response to the Wassermann test should be treated because of the simultaneous effect on the fetus. He divides congenital syphilis into four stages. The first or foetal stage is associated with changes in the viscera,

the endocrine glands and the ends of long bones. Syphilis in the infant is characterized by diseases of the nose and skin, by hydrocephalus and by osteochondritis. The third or condylomatous stage produces mucous membrane lesions, scarring of the mouth, changes in the cranial bones, saddle nose and palpable glands at the elbow. The fourth stage or late syphilis comprises periosteal and gummatous changes in the cranial and long bones as well as Hutchinson's triad—keratitis, deafness and teeth alterations. Infants with congenital hepatic syphilis are generally not jaundiced, because the biliary passages are open. Those with white pneumonia usually die shortly after birth. For treatment he gives twelve intramuscular injections of calomel alternated with "Neo-salvarsan" 0.03 gramme per kilogram body weight and increased gradually to 0.25 gramme. Recently he has tried "Stovarsol" in tablet form with good results. One tablet is equal to 0.25 gramme and one quarter of a tablet is given every day for eight weeks with an interval of several days at the end of each week. The dose is increased to half a tablet for four weeks and then mercury is administered for a considerable period. By the use of these newer methods the prognosis has been considerably improved.

Angina Pectoris in Children.

E. J. STOLKIND (*British Journal of Children's Diseases*, January-March, 1928) discusses the pathogenesis of *angina pectoris* in children and gives the histories of a number of patients. This condition is very rare in children, but it can be proved that children are subject, though seldom, to the same diseases of the circulatory and nervous system as adults. The characteristic symptoms of angina are given as (i) attacks of pain, (ii) "angor animi" with a sense of impending death and (iii) irradiation of pain usually to the left, though sometimes to the right or even to both sides in the area of distribution of the brachial or cervical plexus. This syndrome is purely subjective and therefore it is impossible to ascertain its presence in infants. The author believes that the main factors in the pathogenesis are: (i) The chemical or "toxic" substances circulating in the blood; (ii) the state of the nervous system, especially the autonomic system and the disposition of the patient; (iii) the condition of the heart and aorta. By toxic causes the author means the products of abnormal internal secretions, metabolites, normal or abnormal, the biochemical changes connected with diabetes, nephritis *et cetera*. Apparently anything which alters the hydrogen ion concentration of the blood, can affect the contractions of the heart. Lactic acid affects muscle contraction and so do the so-called pressor and depressor substances produced either by the ductless glands or by the tissues. Changes in the hydrogen ion concentration may occur locally in the heart owing to a deficiency in the circulation. Accord-

ing to Andrus, Carter and others all phenomena of cardiac rhythm can be explained by considering that this is due to rhythmic building up and discharge of a potential difference across a semipermeable membrane. Zondek states that the electrolytes (for example those of potassium and calcium), toxins of the cells and stimulation of the cardiac nerves all have similar effects on contraction. Toxins such as nicotine and digitalis have their effect on the heart muscle and have both been known to cause anginal attacks. The next and most important factor in the pathogenesis is the nervous factor. The heart and aorta may give rise to pain, for sensory nerve endings have been demonstrated in the myocardium and pericardium and in the middle coat of the aorta. Franck as a result of his experiments concluded that most of the sensory fibres pass by way of the cervical sympathetic and vertebral nerves. Many experiments have been carried out since then and operations for the division of the thoraco-cervical sympathetic have been performed in cases of angina with sufficient success to support Franck's conclusions. Through the efferent fibres of the vagus and sympathetic reflex stimuli may affect the heart and aorta. Stimuli which would not affect a normal heart, may give rise to pain or even to an anginal attack in a pathological condition. The author records a number of cases of angina occurring in children and points out the difficulty of diagnosis. Amongst the conditions which have to be differentiated are asthma, nervous heart pain, pain following exhaustion or excitement, pain of pericarditis, pain after meals, neuralgia, neurasthenia. The prognosis depends on the extent to which the heart and aorta are affected.

The Differential Diagnosis of Appendicitis in Children.

F. SHAPIRO (*Medical Journal and Record*, April 4, 1928) gives a list of conditions resembling appendicitis in children with their differential diagnosis. First on the list come gastrointestinal disturbances characterized by abdominal pain, vomiting and fever. The history, the less acute onset and the less severe pain, accompanied by greater constitutional disturbance, help to differentiate these disturbances from appendicitis. In appendicitis the pain precedes the vomiting, while the reverse is the case in gastrointestinal disturbances. Careful palpation may elicit rigidity in the right iliac region; a rectal examination and a blood count may also help in the diagnosis. Acute intestinal obstruction generally produces early tympanites, profuse vomiting, more abrupt onset and more severe pains. The presence of a normal or subnormal temperature and very obstinate constipation are also points in favour of this condition. Intussusception presents the following picture: Intermittent colicky pains, profuse vomiting, blood and mucus in stools and later the characteristic sausage-shaped tumour. Cystitis and right-sided pyelitis can be diagnosed on examination

of the urine. Acute naso-pharyngeal obstruction sometimes gives rise to right-sided abdominal pain, due to involvement of the abdominal lymphatic glands and to fever and vomiting. A careful examination of the naso-pharynx, history of exposure, degree of fever and absence of rigidity are points in the differential diagnosis. Influenza of the abdominal type must be excluded. If abdominal pain comes on several days after the onset of fever, enteric fever should be suspected and a Widal test done. Pneumonia has been diagnosed as appendicitis and *vice versa*, but a careful examination should avoid this mistake. Hysteria must be taken into consideration in a certain type of child. Rheumatism involving the right hip will sometimes resemble appendicitis, but the history, the presence of swelling around the joint, the sweating and perhaps a cardiac murmur will help in making a diagnosis. Other conditions which the author includes in the differential diagnosis are: Perinephric abscess, right-sided pleurisy, trauma, abscess of abdominal wall, cyst of right ovary, salpingitis, diverticulitis, renal stone, psoas abscess, osteomyelitis of the iliac fossa, gall stones, *tabes mesenterica*, stone in the ureter and sprain of the right hip.

Relapses in Scarlet Fever.

A. H. G. BURTON AND A. R. BALMAIN (*The Lancet*, May 26, 1928) writing on their experiences at the Ilford Isolation Hospital, at which 432 patients with scarlet fever were treated in twenty-one months, state that contrary to text book statements, relapses in scarlet fever are not uncommon (4.16%) and of very considerable practical importance. The majority of relapses occurs in young children and most commonly between the twentieth and fiftieth days of the disease. The authors consider that the Dick test should be applied to patients with scarlet fever admitted to isolation hospitals, if these relapses are to be avoided. No patients yielding a definite reaction during convalescence should be retained in a general ward, but should be either isolated, immunized or kept separated at home for the remainder of their convalescence. There seems to be a large class of patients in which the blood is unresponsive to the toxin of scarlet fever in the production of antitoxin; in such persons, though quick recovery may follow a mild attack of the fever, relapses or several further reinfections are likely to occur. Relapses, of course, are primarily due to the patient's lack of immunity and may be caused (i) by an autoinfection from the virus still present in the body of the patient or (ii) by cross-infection with the same type of *Streptococcus scarlatinae* as originally infected the patient or (iii) by a cross infection with a second type of the same organism.

Cerebro-spinal Fluid Pressure in the New Born.

For seven years D. Munro (*Journal of the American Medical Association*,

May 26, 1928) has collected data relative to the pressure of the cerebro-spinal fluid in the new born. He states that the normal fluid pressure in the new born, as determined from figures from patients treated for cranial or intracranial injuries and discharged as symptom-free, lies between six and two millimetres of mercury. A pressure below two millimetres occurs only in the presence of severe surgical shock or after dehydration. An increase is present in every patient with depressed fracture, intracranial hæmorrhage, cerebral œdema or cerebral congestion. This hypertension may be safely reduced to normal, regardless of its degree.

Influence of Environment on Rheumatic Infection in Childhood.

R. MILLER (*The Lancet*, May 19, 1928) considers that environment in childhood plays an important part in the production of rheumatic lesions. Unsuitable conditions of living lead, he thinks, to increased virulence in the bacterial agent, to lowered resistance in the patient or to development of abnormal conditions which may act as a preliminary to infection. There is a very clear class incidence in rheumatism; it is massed among the children of the poor and is practically absent among the offspring of the rich. Yet, under proper residential conditions, as in boarding schools, rheumatism does not occur, even amongst the poorest children. Heredity and diathesis, the author considers, are not factors of the slightest importance in the incidence of the disease. Contagion does not occur either in hospital wards or the unhealthy homes of the poor. There is undoubtedly a close relation between rheumatism and tonsillar disease and one reason of the immunity of well-to-do children is the early and complete removal of the diseased tonsils, as practised at the present day. General lowering of resistance is produced by such factors as poverty, underfeeding, urbanization and industrial life. Of the environmental conditions, however, the two of greatest importance are poverty and damp dwellings. It might be stated that without these two evils there would be no rheumatism.

Goitre in the New Born.

H. H. SKINNER (*Medical Journal and Record*, April 4, 1928) bemoans the fact that although a considerable amount of literature has been written and a considerable amount of research has been done on congenital goitre in animals, the results obtained have never been applied to the human infant and literature is sadly lacking on the subject. In 1923 the author reported 140 confinements occurring during the preceding year and during this time he observed fourteen goitres in the new born. Since that time 900 prospective mothers have been treated, treatment being commenced as early as possible in pregnancy by iodine in doses of ten milligrammes three times a week. Those mothers who took the iodine regularly, have not given birth to a single goitrous baby.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at Saint Vincent's Hospital, Melbourne, on June 20, 1928. The meeting took the form of a series of demonstrations by members of the Saint Vincent's Hospital Clinical Society.

Dislocation and Fracture of the Mandible.

DR. MURRAY MORTON showed radiograms taken from two patients suffering from unilateral dislocation of the lower jaw complicated by fracture through the neck of the mandible. Both conditions had been treated by open operation in order to reduce the dislocation, the fracture being treated by means of an interdental splint with the jaws held apart.

Fracture of the Humerus.

Dr. Morton also showed a patient with severe compound fracture of the humerus who had been four months under treatment with a good functional result. The patient had recently refractured the bone and the line of fracture was through the callus with no displacement.

Malignant Disease of the Stomach.

MR. H. B. DEVINE showed patients and specimens illustrating malignant disease of the stomach.

One patient was shown, aged sixty, whose illness dated back five months. The illness had started with vomiting and sickness after meals which had gradually got more frequent till finally he had vomited a large quantity at the end of the day. He had never had any pain whatever after meals. Constipation had started five months previously and it had got gradually worse till he had great difficulty in getting his bowels open. He had no tender spot and no tumour. A visible peristalsis could be clearly demonstrated. X ray examination revealed an enormous stomach with a rounded-off prepyloric part. Mr. Devine pointed out that the patient was undoubtedly suffering from pyloric carcinoma. He drew attention to the insidious and painless onset and to the fact that, as often occurred, no tumour could be felt. He pointed out that sickness after meals, rather than pain, was a feature of most cases of carcinoma of the stomach, while pain, rather than sickness, on the other hand, was a characteristic of an innocent ulcer of the stomach. He remarked that in his experience there was a class of carcinoma occurring in young people, a submucous infiltration of the gastric wall, which was not associated with ulceration or tumour formation, but if it surrounded the lumen of the stomach caused pain just like an innocent gastric ulcer. Furthermore, this type of growth gave a sharp-edged (at least in its early stages) deformation of the stomach very often radiologically diagnosed as a prepyloric spasm secondary to a prepyloric ulcer. As the radiological evidence thus rather backed up the clinical criteria, it meant that the condition of many of these patients was often erroneously diagnosed and they were treated as gastric ulcer patients.

He then showed lantern slides of the histories and skiagrams of patients to show various stages of this type of carcinoma of the stomach.

The first history he showed was from a patient in regard to whom a clinical diagnosis of ulcer of the stomach had been made because of pain two hours after meals and because the free acid was 21. The radiologist had also quite independently made a diagnosis of prepyloric ulcer because of the small sharp-edged, prepyloric, spasm-like deformation. This man had died two and a half years afterwards of carcinoma of the stomach, probably of this slowly-growing, infiltrating, lymphatically-spreading type. It was obvious, looking at the skiagram retrospectively, that a diagnosis of early carcinoma would have been more rational.

The histories and skiagrams of later stages of this class of patient were shown to demonstrate that these conditions were much easier to diagnose clinically and radiologically, but that a study of them helped to elucidate more easily the difficult earlier stages.

Carcinoma of the Bladder.

Mr. Devine also showed a moderately large carcinoma removed from the bladder by partial cystectomy. A small bladder about as big as a small egg was made of what were the remnants of the bladder. The history of this patient was interesting. She had had a pain in her kidney for years, a small stone had been demonstrated by X rays, but she had refused surgery. For the previous four months she had suffered from frequency of micturition and from pain at the end of micturition; gradually this had got worse and then profuse hæmaturia had developed with great pain and straining at the end of urination. It had been supposed that this was caused by the stone passing down into the bladder. For three months her condition had remained undiagnosed, although clinically it was a typical history of malignant disease of the bladder. Mr. Devine pointed out that the diagnosis was not academic, because in this case the growth had been completely and successfully removed.

Hydronephrosis.

An interesting hydronephrosis specimen was also shown. In this the uretero-pelvic junction was quite patent. Urine flowed from the uretero-pelvic junction through a moderately sized cannula quite easily introduced. Powerful peristaltic waves had been observed to within twelve millimetres (half an inch) of the pelvo-ureteral junction. Here a muscular spasm had prevented the action of the peristaltic wave becoming effective and a retroperistaltic wave had been immediately set up. The ureter had been cut across and during the peristaltic movement no urine had issued from the patent uretero-pelvic junction. After the kidney was removed from the body, muscular incoordination being, of course, impossible, urine had flowed freely from the ureter when the kidney was held up. The hydronephrosis was due to an incoordination of the neuro-muscular mechanism of the pelvis and a disorder of emptying comparable to the disorder which he had seen occur in other hollow viscera.

Duodenal Ulcer.

A specimen was shown of ulcer of the posterior wall of the duodenum taken from a patient who had not given the typical symptoms of duodenal ulcer. This ulcer had been very difficult to demonstrate at operation. It was flat, shallow and not very obvious. It had been missed in a previous operation two years previously.

Fractures of the Forearm and Hand.

DR. J. NEWMAN MORRIS and DR. HAROLD MOORE showed a series of patients suffering from fractures of the bones of the forearm and hand, illustrating the variations in results in different conditions, even when the same injury was treated by the same surgeon by the same methods.

Dislocation of Cervical Vertebra.

Dr. Morris also showed a patient suffering from dislocation of the fourth cervical vertebra who had first attended hospital six weeks after the accident producing the dislocation. There had been no signs or symptoms of injury to the spinal cord, although there were signs of irritation of the cervical plexus on the right side. Reduction had been attempted first without and later with a general anaesthetic, but without success and the patient was going about in a plaster support.

Fracture of the Lumbar Vertebra.

Another patient of Dr. Morris was suffering from a compression fracture of the fourth lumbar vertebra due to being crushed under a wall about a month before coming to the out-patient department. The points of interest in this case were that the fracture was somewhat lower than the usual site and that the patient complained of pain down the inner side of his right thigh and difficulty in walking rather than of pain in his back.

Suppurative Salpingitis.

DR. A. N. McARTHUR showed a patient on whom he had performed posterior colpotomy for bilateral tubal abscesses in Douglas's pouch, gonorrhœal in origin. The patient had been in a medical ward for a week previous

to operation with no rise in temperature, but an increased pulse rate. He said that he showed this patient so that discussion might be excited on the treatment of such tubal conditions.

In his paper read at the meeting of the Victorian Branch of the British Medical Association in Melbourne and published in *THE MEDICAL JOURNAL OF AUSTRALIA* of June 16, 1928, Mr. Victor Bonney stated that he was in favour of operating on patients with acute salpingitis as soon as the condition was diagnosed, as it was rare for a tube so affected ever again to become patent and capable of carrying an ovum. Mr. Bonney was against the policy of treating acutely inflamed tubes by waiting.

Dr. McArthur said that acutely inflamed appendices were removed at once because it was known that they might burst and infect the general peritoneum, whereas an infected tube soon became closed by the sticking of the fimbriae to each other and to the peritoneum, producing what might be called an autodelimitation of disease. The bacteria, being aerobic, enclosed in the tubal sac, became less and less virulent, whereas to open an acutely inflamed tube with a virulent infection was more liable to produce a fulminating peritonitis. In view of Mr. Bonney's method of treatment there was an excellent opportunity for members to discuss the matter.

Uterine Fibroids and Pregnancy.

Dr. McArthur's second patient was a woman, aged thirty-six, who had had an early miscarriage about two years previously and for eighteen months had had frequent attacks of hæmorrhage during which time she lost 25.2 kilograms (four stone) in weight. Since the miscarriage she had not become pregnant, but was very desirous of children. On examination the uterus had been symmetrical in contour and a little enlarged; it had been diagnosed as having a fibroid in the fundus occluding the internal ostia of the tubes. The fibroid had been enucleated from the fundus and was found to be interfering with the intrauterine portion of both tubes. Five other small fibroids had been dug out. As Mr. Victor Bonney had said, socially, sentimentally and psychologically it was evident that wherever possible one ought to do something better than chop the uterus off. This had been done to this patient's great mental relief; but had it cured the sterility? Dr. McArthur did not know; but he quoted a patient whom he had seen some years before. A young woman's first pregnancy had terminated because of the presence of a very large fibroid. After that Dr. McArthur had enucleated the fibroid. There had been very little uterus left, fragments here and there of uterine wall and mucosa and it had been impossible to know where the intrauterine canal or the salpinges were. The best had been made of a bad business. Fragments of mucosa had been sewn together. Fragments of uterus had been sewn together and in the end it had looked almost like a uterus. Eighteen months afterwards the patient had been delivered of a fully developed child. Therefore, they need never despair and Dr. McArthur's patient was an appeal in Mr. Bonney's favour to save the uterus.

Injection Treatment of Varicose Veins.

MR. RONALD DAVIDSON showed patients whose varicose veins had been treated by injection. The solution used in the majority was one of quinine hydrochloride, four grammes, and urethane, two grammes, in thirty cubic centimetres of water.

Injections of half a centimetre were given intravenously, not more than two cubic centimetres of solution being used at any one treatment. The injections were given every week. It was found that each injection caused a thrombosis of one to two inches of vein. Occasionally it was found necessary to inject perivenously in large varices. Two or three minims of solution were injected perivenously, the resulting reaction being more severe. Varicose ulcers appeared to heal quickly when the varicose veins around them were injected and thrombosed. No alarming symptoms or reactions had been noted.

Pernicious Anæmia.

DR. J. W. GRIEVE showed a woman, aged thirty-seven years, who was suffering from pernicious anæmia of three

years' duration. The illness had commenced with typical symptoms and hæmatological findings. In 1925 and 1926 she had been treated with dilute hydrochloric acid and arsenic with temporary improvement. In 1927 she had been admitted to Saint Vincent's Hospital in July and had been treated by blood transfusion and splenectomy. In September she had reported to the out-patient department complaining of a sore tongue. Her red blood corpuscles numbered 1,617,000 per cubic millimetre and the blood film had been typical of pernicious anæmia. After a second blood transfusion and a course of liver feeding her red blood corpuscles numbered 3,120,000. When seen in 1928, she had continued irregularly with her liver feeding. Her red blood corpuscles numbered 3,400,000, her leucocytes 8,000 per cubic millimetre and her hæmoglobin value was 70%, the colour index was 1.0. The abnormalities in the blood film had improved, she had gained weight and her sore tongue had improved.

She had reported again on May 25. She had not been taking her liver feeding regularly and had sometimes missed a whole week. Her red blood corpuscles had numbered 2,550,000 per cubic millimetre, the hæmoglobin value was 63% and the colour index was 1.3. The blood film had again appeared characteristic of pernicious anæmia. Since then she had been taking liver feeding regularly and had improved in appearance and symptoms and her hæmoglobin had risen to 75%.

Dr. Grieve's second patient was a woman, aged fifty-six years, suffering from pernicious anæmia of eighteen months' duration. She had been admitted to hospital in December, 1926, with symptoms of gastro-intestinal upset and had presented the characteristic signs of pernicious anæmia. The red blood corpuscles had numbered 1,270,000 and leucocytes 6,300 per cubic millimetre, the hæmoglobin value had been 26% and the colour index 1.0, with a characteristic blood film appearance. She had been treated by blood transfusion when first seen and liver feeding had been commenced twelve months previously. She was also being given dilute hydrochloric acid and arsenic. She had been troubled with glossitis for some time, but had lately been feeling very well. In March, 1928, her red blood corpuscles had numbered 4,500,000 per cubic millimetre, the hæmoglobin value was 100% and the colour index 0.9. The blood film was practically normal.

Multiple Hydatid Disease.

Dr. Grieve's third patient was a woman, aged thirty-three years, suffering from multiple hydatid disease for which she had had fifteen operations, the first thirteen years and the last eighteen months previously. She was said to have had cysts removed from the right lung, liver, kidneys and pelvis and had had attacks of urticaria. Recently she had had pain in the left side of the chest. Hydatid complement fixation and Casoni tests yielded positive results and X ray examination revealed signs of hydatids in the splenic region.

Clinical examination revealed signs of multiple abdominal hydatids, especially in the lower part of the abdomen and pelvis. In this situation a typical hydatid thrill was easily elicited.

Auricular Fibrillation.

Dr. Grieve's fourth patient was a man, aged forty-two years, suffering from auricular fibrillation. The onset had been sudden three weeks before, with palpitation, faintness, dyspnoea and præcordial distress following a hard day's work. He had been perfectly well till the onset of this trouble and there was no history of fevers. Examination on admission had revealed a rapid, irregular heart action with many impulses not reaching the wrist. The apex beat of the heart had been in the seventh interspace, 17.5 centimetres from the mid-line. A systolic bruit had been audible at the apex beat. The urine had contained albumin and blood. The liver had been one finger's breadth below the costal margin. There had been no oedema. Digitalis in ordinary doses had been administered with some improvement and it had been thought that he was a suitable subject for quinidine, but this drug had only aggravated his symptoms. His eyes were rather prominent, but there was no tremor or thyroid enlargement. In further investigation of the condition it was proposed to subject the blood to the Wassermann test and to estimate the basal metabolic rate.

Encephalitis Lethargica.

Dr. F. J. NIALl showed a man, aged twenty-four years, a worker in the boot trade. He complained of giddiness, faintness and dullness across the frontal area. His health had been good up to the beginning of 1927, when he had become giddy and could not walk. He had been in hospital at that time for five weeks and it had been supposed that he suffered from diabetes and "heart trouble"; he had had albumin and sugar in his urine. On the present occasion investigation showed him to be not diabetic, his urine was normal and he had no abnormal urinary symptoms. He had had no infectious diseases except measles and whooping cough and he denied having had venereal disease. In addition to giddiness he had noticed transient diplopia six weeks before.

On examination it was found that his speech tended occasionally to be of the "scanning" type. His pupils were equal and reacted to light. There was nystagmus, clockwise on turning the eyes to the right and anticlockwise on turning them to the left. On looking ahead there was a fine rhythmic lateral nystagmus. No abnormal signs were found on examining the other cranial nerves. There was no paresis or ataxia and his gait was normal. There was some hypertonicity of muscles, but no clonus or Rombergism. No abnormalities of sensory function were detected. The deep muscular reflexes were all present and were abnormally active, including the jaw jerk. The right superficial abdominal reflex was normal, the left was not elicited. The right plantar reflex was extensor, the left was not obtained. The visual fields were normal and there were no signs of optic atrophy. The tonsils were hypertrophied. The Wassermann test failed to yield a reaction. The diagnosis of *encephalitis lethargica* was generally agreed to, but the possibility of cerebrospinal syphilis with an absence of response to the Wassermann test was also suggested.

Adiposis Dolorosa.

Dr. Niall's second patient was a married woman, aged thirty years, who complained of progressive swelling of the legs. She had had four operations, the first for appendicectomy, the next two for uterine ventrosuspension and partial oophorectomy and the fourth for left ureteral calculus. She had three children, aged respectively seven, three and one year and seven months. Before marriage she had been thin. Her family history was unimportant. Her present complaint had commenced four years before with swelling of the left leg, just above the ankle with gradual spread upwards towards the knee. The other leg had become affected in the same manner a few weeks later. Her feet were not involved in the swelling. For the last three years she had had a dull, aching pain in her pelvis, with difficulty in walking, more pronounced on the left side and occurring before and during her menstrual periods. This pain was not improved by rest and tended to occur slightly at other times. The swelling of the legs was not influenced by posture.

On examination her weight was seventy kilograms (eleven stone). No abnormality was detected in her tongue, throat, teeth, thyroid gland, heart, lungs, central nervous system or abdomen. Her systolic blood pressure was 135 millimetres of mercury and the diastolic pressure was 75 millimetres. Routine pelvic examination revealed no abnormality and no deviation of complement occurred in the Wassermann test. An estimation of her basal metabolic rate was inconclusive. The urine was normal. X ray examination of the skull revealed abnormal "bridging" of the pituitary fossa and narrowing of the fossa itself.

The legs were symmetrically enlarged from just above the malleoli to just below the knees. The skin was normal and the enlargement preserved the general outline of the legs. There were no nodular or discrete swellings and no pitting on pressure. On active movement the muscles seemed to be normal in size and function. The calf measurements were approximately forty-five centimetres (eighteen inches). There was no superficial swelling elsewhere. The condition was regarded as one of diffuse symmetrical lipomatosis or *adiposis dolorosa* (Dercum's disease).

The possibility of its being Milroy's disease (persistent hereditary oedema of the legs) was also suggested. The continuance of thyreoid medication was agreed to and it was suggested that pituitary extract might be tried hypodermically.

Tabes Dorsalis.

Dr. Niall's third patient was a woman, aged fifty-three years, who complained of giddiness of three months' duration. At times objects seemed to move around her and she felt as if she would fall forward. She had not had headaches recently and was sleeping well. She had had some pain in her feet. There were no abnormal visual, auditory, gastro-intestinal or urinary symptoms and she said that she had had no serious illnesses.

She had been married twenty-eight years and had had four living children; these were healthy, married and had families. Then had followed domestic trouble and she had had nine premature and still-born children. One premature child had survived and later had died in the Kew Asylum. Six years previously she was said to have had a positive response to the Wassermann test and had been treated by iodides and injections of "Novarsenobillon." There had been no history of any nervous lesion at that time.

On examination the apex beat of the heart was found to be in the fifth intercostal space 11.5 centimetres (four and a half inches) from the mid-line. There was one finger's breadth of cardiac dullness to the right of the sternum. The aortic second sound was accentuated and ringing. Her blood pressure was 220 millimetres of mercury systolic and 135 diastolic. The liver was enlarged downwards two fingers' breadth below the costal margin. The pupils were very small and reacted to accommodation, but not to light. The eye movements were normal. There was no nystagmus. No abnormality was detected in the functions of the other cranial nerves. Rombergism was elicited, but the gait was normal with no ataxia. No deep reflexes were elicited. Superficial and deep sensory functions were normal. Her plantar reflex was extensor on the left side and doubtful on the right. The blood serum caused a partial deviation of complement in the Wassermann test, performed by the ice-box method. Lumbar puncture had been performed and the cerebro-spinal fluid had been obtained under slightly increased pressure. It was clear macroscopically, but microscopically it contained a few red blood corpuscles and one leucocyte per cubic millimetre. It failed to cause deviation of complement in the Wassermann test. The globulin test (Paudy) yielded no reaction.

Dr. Niall drew attention to the following points of interest in the case: (i) History of infection with syphilis at the age of about thirty years, as indicated by her obstetrical history. (ii) The presence of a plantar extensor reflex with signs of *tabes dorsalis*, although there were no "lightning pains" or sensory changes. (iii) The normal findings in the cerebro-spinal fluid.

The neurological signs were regarded as being evidence of a former infection of the central nervous system and not of present active syphilitic disease. This view was supported by the decided improvement which followed treatment devoted chiefly to the cardio-vascular system. The patient had been given small doses of potassium iodide and intramuscular injections of one cubic centimetre of "Bismol" every week for ten injections.

Members at the meeting agreed with Dr. Niall's opinion and did not recommend any more active antisiphilitic measures.

Abscess of the Lung.

Dr. W. J. NEWING showed a woman, aged fifty years, who was suffering from a lung abscess of two years' duration which had appeared suddenly with high fever and copious expectoration. It had not been possible to determine the cause. When the patient was first seen six months previously, the abscess had been very large, occupying the peripheral half of the right lower lobe and discharging more than half a litre per day of very offensive pus, which contained large numbers of rod-shaped and spiral organisms. Very advanced clubbing of the fingers had occurred, also hypertrophic osteoarthritis, affecting the wrists, knees and spine.

The abscess had been opened under local anaesthesia, ten centimetres of the ninth and tenth ribs being removed. Complete and rapid recovery had occurred; an interesting feature being the entire disappearance of the clubbing of the fingers and hypertrophy of the joints.

Dr. Newing's second patient was a woman, aged thirty-two years, who was suffering from a lung abscess which had occurred after extraction of teeth under general anaesthesia in April, 1926. The abscess had been centrally situated near the right hilus. Every few weeks a febrile attack would occur with discharge of a large quantity of inoffensive pus and blood which contained nothing but pyogenic organisms. The fingers were not clubbed and there was no hypertrophic osteoarthropathy. Artificial pneumothorax had been performed eight months previously, an intrapleural pressure of ten centimetres of water being produced. Since then there had been no return of cough.

Peripheral Neuritis.

Dr. G. P. O'DAY showed a man, aged twenty-seven years, who had been suffering from ataxia for two months. The blood yielded no reaction, but the cerebro-spinal fluid yielded a "feeble partial" reaction to the Wassermann test. There was no increase of lymphocytes in the cerebro-spinal fluid, but there was some increase in its albumin content. Examination of the central nervous system revealed absence of the knee jerks and ankle jerks and some "patchy" analgesia and anaesthesia of the distal parts of all four limbs. Römberg's sign was present. There was no history of alcoholism or of recent febrile illness. The patient had recovered rapidly under antisyphilitic treatment. Dr. O'Day showed this patient for the opinion of members as to diagnosis which seemed to lie between peripheral neuritis and juvenile *tubes dorsalis*.

The members leaned towards the diagnosis of peripheral neuritis, although it was admitted that the Wassermann reaction was consistent with a diagnosis of juvenile *tubes*.

Syphilis.

Dr. O'Day also showed a male, aged thirty-six years, and two females, aged forty-two and fifty years respectively, all suffering from pain in the right shoulder and arm of some months' duration. On general examination no abnormal signs were found except that the blood serum caused very strong deviation of complement in the Wassermann test in all three instances and antisyphilitic treatment had rapidly removed the pain. All had undergone other forms of medical treatment without relief and they were shown to demonstrate that pain in that situation was sufficient to arouse suspicion of syphilis.

Skiagrams.

Dr. J. O'SULLIVAN showed a series of interesting skiagrams. Among the number were films of a tumour of the jaw, taken before and after operation. There was a large defect in the lower ramus of the right mandible, its outline appeared sharp. There was a definite expansion of bone at this site. Definite reticulation could be seen in the swelling which replaced the bone. The X ray appearance was suggestive of a giant cell tumour. Examination after removal of the tumour had proved this to be correct.

In another film no filling of the gall bladder had occurred when a cholecystogram was prepared. Two calcified hydatid cysts, corresponding to the two shadows seen on the film, had been found at operation. One had been embedded in the upper surface of the liver, the other between the two lobes in the sulcus of the falciform ligament. The gall bladder had been found diseased and dilated, probably due to pressure of the second hydatid on the cystic duct.

Papilloma of the Larynx.

Dr. J. M. BAXTER showed a female patient, aged twenty-seven years. At the age of thirteen years she had had a laryngo-fissure performed for papilloma of the larynx. This had been followed by obstructed respiration and complete aphonia. The symptoms had continued until four years previously when she had come under his notice. At that time there had been multiple papilloma of both cords together with complete aphonia and

obstructed respiration. Removal by indirect method had been unsuccessful.

Laryngo-fissure, preceded by tracheotomy, had been done, the growths had been removed and the raw surfaces wiped with absolute alcohol. A month later the voice had gradually returned. Four years had elapsed and the present condition was highly satisfactory. There had been no sign of recurrence. The patient had an excellent voice and cord movements were perfect.

Dr. Baxter was of opinion that a laryngo-fissure was the best way of attacking such growths.

Cerebral Lesion.

Dr. Baxter also showed a girl, aged ten years who when first seen had had left otalgia of two days' duration. Paracentesis had been done, pus being evacuated. Two days later symptoms of left mastoiditis had been present. The mastoid had been opened and the antrum and cells were found to be full of pus. During operation the *dura mater* had been exposed. Four days later the child had complained of severe head pains and the right arm had been slightly paretic. During the next few days the right arm had become completely paralysed and the right leg paretic. The child had become delirious and semi-comatose. The *fundi oculorum* had been normal, the cerebro-spinal fluid had been under increased pressure, but otherwise normal. The child had had five convulsions of a general character. A diagnosis of an abscess in the brain had been made. The skull had been opened commencing from the previous exposure of *dura mater*. There had been no pulsation of *dura mater*, but some bulging. The *dura mater* had been incised and there had been an escape of fluid under increased pressure. The brain had been explored for pus, but without result. The wound had been closed and a few days later the child's condition had gradually improved. The right leg and then the right arm had slowly recovered. Six weeks later the child had been apparently well.

Granuloma of the Epiglottis.

Dr. Baxter's third patient was a woman, aged thirty-two years, who was presented for diagnosis. She had had symptoms of slight hoarseness and discomfort in her throat since December, 1927. Both arytenoid cartilages were swollen and pear-shaped and of a pale colour. The epiglottis had been swollen and juicy and on its posterior aspect there had been a polypoidal ulcerating granuloma. Vocal cord movements were normal. No tubercle bacilli were found in her sputum.

Radiological examination of the lungs did not reveal any definite signs of disease. The blood serum caused a partial deviation of complement in the Wassermann test.

She had been given a course of "Neo-salvarsan" together with potassium iodide and mercury. Complete rest of the voice had been ordered. After four months' treatment there was no change in the condition, except that the patient had gained in weight.

A month previously the granuloma of the epiglottis had been treated by diathermy with good results.

Epithelioma of Tonsil.

Dr. Baxter's fourth patient was a man, aged sixty-two years. He had had a sore throat for four months. His left tonsil had been swollen and fungating and the swelling had extended down to the adjoining base of the tongue. A small gland in the neck had been palpable. A specimen of the gland had been reported on by the pathologist as being an epithelioma. An extensive dissection of the left side of the neck had been done and the external carotid artery tied. A fortnight later the growth of the tonsil and adjoining tongue tissue had been treated by diathermy. The result was satisfactory, but the time was too short to allow a definite prognosis to be given.

It was surprising to find that the patient suffered almost no pain although a very extensive diathermy had been done.

As there was always a great liability to arterial hæmorrhage when the sloughs were separating, it was advisable to tie the external carotid artery in such cases.

Atresia of the External Auditory Meatus.

Dr. H. S. FORREST presented a patient who was suffering from atresia of the external auditory meatus following

several mastoid operations which extended over four years. The case was of interest for the following reasons: (i) A subperiosteal abscess had developed three times at intervals of two years; (ii) a radical operation had been performed at the third operation; (iii) the mastoid cavity had rapidly filled with exuberant granulations; (iv) the atresia of the external auditory meatus had developed even after various plastic operations and prolonged packing.

Epithelioma of the Oesophagus.

Dr. Forrest's second patient was suffering from epithelioma of the pharyngeal oesophageal orifice. The growth extended to the posterior pharyngeal wall and laterally. A month previously through a Jackson's laryngoscope two needles (2.5 milligrammes each) of radium had been implanted into the growth for two hours and the previous week diathermy (electrocoagulation) had been carried out without any untoward effects.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been nominated for election as members of the New South Wales Branch of the British Medical Association:

- Conolly, Henry Willams, M.B., 1909 (Univ. Sydney), 83A, Darlinghurst Road, Darlinghurst.
 McDonald, Kenneth David, M.B., B.S., 1928 (Univ. Sydney), 109, Burns Bay Road, Lane Cove.
 Russell, Gerald, M.B., B.S., 1927 (Univ. Sydney), Sydney Hospital.
 Rennie, Harry Maynard, M.B., B.S., 1928 (Univ. Sydney), 24, Wolseley Road, Point Piper.
 Walker, Jack Frederick, M.B., Ch.M., 1926 (Univ. Sydney), Cressy Street, Canterbury.
 Whittemore, John Bede, M.B., B.S., 1927 (Univ. Sydney), Willison Road and Wallace Street, Carlton.

THE undermentioned has been elected a member of the Victorian Branch of the British Medical Association:

- Odlum, Lawrence Edward, M.B., B.S., 1928 (Univ. Melbourne), Bona Vista, Camperdown.

Correspondence.

THE ODOUR OF THE BREATH IN ALCOHOLIC POISONING.

SIR: Apparently a great deal of public criticism has occurred over some medico-analytical evidence I gave this week at the Parramatta Court. After having given for over twenty (20) years similar evidence, I often wonder if it is not sheer waste of time.

If the expressed opinions are new or generally unrecognised, no one believes them, especially if on the side of the defence as one paper puts it "A doctor's excuse!" My evidence was not an excuse but the absolute truth.

In 1906 I worked for ten (10) months in the Physiological Laboratory in the University of Chicago under Professor George Neil Stuart. I did work which covered portion of this form of research and during the last twenty (20) years have amply verified some of my earlier observations; one being that the breath or the smell of the stomach content is no absolute proof in cases of dispute in alcohol poisoning. I have found that certain non-alcoholic beverages in certain individuals will give an odour to the breath, simulating and very difficult to distinguish from the usual odour given off by wine, beer or whisky. I found it also to be present in the following conditions:

1. Undigested new bread especially in the presence of large quantities of free acid.
2. Eating large quantities of oranges.
3. Eating large quantities of apples.

4. Drinking of cider.
5. Drinking unfermented wine.
6. Drinking certain fruit juices.
7. Eating passion fruit.
8. Certain pathological conditions, especially blood in the stomach from malignant tissue.
9. Other well known pathological states.

These odours given off by the above foods vary greatly in individuals, but is markedly accentuated in hyperchlorhydria, especially that caused by disturbed physiological conditions such as great emotion, shock *et cetera*.

I know that these characteristics (unless looked for) are rarely noticed or recorded, yet are very important in cases of dispute.

I see that my statements have been received with doubt from several medical sources, apparently from those who always support so called popular opinion, even though it be incorrect.

Yours, etc.,

A. REGINALD McLEOD.

Sydney.

September 22, 1928.

Obituary.

JOHN FORREST GARDNER.

DR. JOHN FORREST GARDNER whose death occurred at Richmond, Victoria, on August 6, 1928, was the younger son of the late Gavin F. Gardner, a well known share-broker of Adelaide, and a nephew of the late William Gardner, renowned as a surgeon in Melbourne and Adelaide in the 'eighties. He was educated at Saint Peter's College, Adelaide, and studied medicine at the University of Adelaide. He graduated Bachelor of Medicine and Bachelor of Surgery in 1914. After holding resident appointments at the Broken Hill and Ballarat Hospitals, he enlisted for active service and was assigned to transport duty between Australia and Egypt. In 1917 he took up practice in Richmond, Victoria, and remained there until his death. During 1917 he acted as Commonwealth Medical Officer. He married Dr. Hilda Florey, of Adelaide, who survives him. To her and to her two children the sympathy of the profession is extended.

WILLIAM ALEXANDER TEOO LIND.

WE regret to announce the death of Dr. William Alexander Teoo Lind which occurred at Kew, Victoria, on October 6, 1928.

WILLIAM THOMAS JOSEPH NEWTON.

WE announce with regret the death of Dr. William Thomas Joseph Newton which occurred at Croydon, New South Wales, on October 6, 1928.

Proceedings of the Australian Medical Boards.

QUEENSLAND.

THE undermentioned have been registered under the provisions of *The Medical Act of 1925*, of Queensland, as duly qualified medical practitioners:

- Thoms, John Allan, M.B., 1927 (Univ. Sydney), Inglewood.
 Wilson, James Newell Hunton, M.B., Ch.M., 1925 (Univ. Sydney), Adavale.
 Taylor, George Crowley, M.B., Ch.M., 1924 (Univ. Sydney), Brisbane.

Welch, Kenyon St. Vincent, M.B., Ch.M., 1908 (Univ. Sydney), Brisbane.

Heath, Alfred Alexander, M.B., 1925 (Univ. Sydney), Clifton.

Restorations to the Register:

Payne, Percy Herbert, M.B., 1911 (Univ. Sydney), Brisbane.

Graff, Roy, M.B., B.S., 1924 (Univ. Melbourne), Alpha.

VICTORIA.

THE undermentioned have been registered under the provisions of Part I of the *Medical Act 1915*, of Victoria, as duly qualified medical practitioners.

Bannon, Edward Gregory, M.B., B.S., 1928 (Univ. Melbourne), 19, Beach Avenue, Elwood.

Bastow, John, M.B., B.S., 1928 (Univ. Melbourne), Ormond College, Carlton.

Bossence, William Adamson, M.B., B.S., 1928 (Univ. Melbourne), 23, Manning Road, East Malvern.

Brittingham, Lindsay Charles, M.B., B.S., 1928 (Univ. Melbourne), 32, Chrystobel Crescent, Hawthorn.

Brothie, Edward Bonaventure Heffernan, M.B., B.S., 1928 (Univ. Melbourne), 236, George Street, Fitzroy.

Chapman, Henry Thomas, L.R.C.P. et S. (Edinburgh), L.R.F.P.S. (Glasgow), 1928, 324, Montague Street, Albert Park.

Cohen, Abraham Bertram, M.B., B.S., 1928 (Univ. Melbourne), 250, High Street, St. Kilda.

Cooper, Robert William, M.B., B.S., 1928 (Univ. Melbourne), Ormond College, Carlton.

Darbyshire, Joan, M.B., B.S., 1928 (Univ. Melbourne), Janet Clarke Hall, Carlton.

Donoghue, Francis Patrick, M.B., B.S., 1928 (Univ. Melbourne), Nambrok.

Eddy, Eric Alfred, M.B., B.S., 1928 (Univ. Melbourne), 22, Closeburn Avenue, Windsor.

Eville, Violet Polyxena Austin, M.B., B.S., 1928 (Univ. Melbourne), 53, Morrah Street, Parkville.

Farmer, Paul Ward, M.B., B.S., 1928 (Univ. Melbourne), 98, Collins Street, Melbourne.

Farnbach, Ralph Joseph, M.B., B.S., 1928 (Univ. Melbourne), 21, Bellairs Avenue, Footscray.

Farran, Egbert Armytage Cuninghame, M.B., B.S., 1928 (Univ. Melbourne), 24, Airlie Street, South Yarra.

Gault, Edward Woodall, M.B., B.S., 1928 (Univ. Melbourne), 401, Auburn Road, Auburn.

Green, Arthur Ormond, M.B., B.S., 1928 (Univ. Melbourne), 18, Park Street, Burnley.

Hill, Henry Manners, M.B., B.S., 1928 (Univ. Melbourne), 17, Keane Street, Cottesloe, Western Australia.

Houghton, Percy Byron, M.B., B.S., 1928 (Univ. Melbourne), Ouyen.

Howard, Russell Norfolk, M.B., B.S., 1928 (Univ. Melbourne), 10 Flat, Kingsclere, Fitzroy Street, St. Kilda.

Johnston, Herbert Oswald, M.B., B.S., 1928 (Univ. Melbourne), 76, Coppin Street, East Malvern.

Kaines, Gwendolen Elizabeth, M.B., B.S., 1928 (Univ. Melbourne), Fernhurst Grove, Kew.

Lidgett, Kelvin, M.B., B.S., 1928 (Univ. Melbourne), "Braelands," Myrning.

Mancy, Alexander George, M.B., B.S., 1928 (Univ. Melbourne), 124, Camberwell Road, Camberwell.

McColl, Bernard Howard, M.B., B.S., 1928 (Univ. Melbourne), 35, James Street, Northcote.

MacKnight, Ella Annie Noble, M.B., B.S., 1928 (Univ. Melbourne), "Dunmare," Albury, New South Wales.

McLennan, Simon, M.B., 1914, Ch.M., 1928 (Univ. Sydney), Repatriation General Hospital, Caulfield.

McNamara, Matthew Joseph, M.B., B.S., 1928 (Univ. Melbourne), 62, Armstrong Street, Middle Park.

McQueen, George Hugh, M.B., B.S., 1928 (Univ. Melbourne), Ridley College, Parkville.

O'Brien, Dennis Francis, M.B., B.S., 1928 (Univ. Melbourne), Newman College, Carlton.

Odlum, Lawrence Edward, M.B., B.S., 1928 (Univ. Melbourne), "Bona Vista," Camperdown.

Park, Alexander Tremaine, M.B., B.S., 1928 (Univ. Melbourne), 19, Pratt Street, Moonee Ponds.

Phipps, Henry David, M.B., B.S., 1928 (Univ. Melbourne), 38, Foam Street, Elwood.

Purser, Joseph Alexander, M.B., B.S., 1928 (Univ. Melbourne), Piawaning, via Toodyay, Western Australia.

Ratazzi, Leo Ludwig, M.B., Ch.B., 1927 (Univ. Edinburgh), Hospital for Insane, Sunbury.

Richards, Eulalia Sisley, L.R.C.P. et S. (Edinburgh), L.F.P.S. (Glasgow), 1904, Warburton.

Robinson, Norman Henry, M.B., B.S., 1928 (Univ. Melbourne), Melville House, Albany, Western Australia.

Rodda, Edgar Kenneth, M.B., B.S., 1928 (Univ. Melbourne), 29, Darling Street, South Yarra.

Rutherford, Gideon McCrae, M.B., B.S., 1928 (Univ. Melbourne), 27, May Road, Toorak.

Sandner, Eugene, M.B., B.S., 1928 (Univ. Melbourne), 160, Bridge Street, Bendigo.

Slater, Peter Reginald, M.B., B.S., 1928 (Univ. Melbourne), 29, James Street, Northcote.

Solomon, Norman Josiah, M.B., B.S., 1928 (Univ. Melbourne), 187, Gore Street, Fitzroy.

Stonham, John Geoffrey, M.B., B.S., 1928 (Univ. Melbourne), 36, Mayston Street, Upper Hawthorn.

Thomas, David Lewis Gordon, M.B., B.S., 1928 (Univ. Melbourne), 8, Lorne Grove, Camberwell.

Thorburn, Ian Oriel, M.B., B.S., 1928 (Univ. Melbourne), 101, Drummond Street, Carlton.

Turner, Edwin Watchorn, M.B., B.S., 1928 (Univ. Melbourne), 32, Mona Street, Battery Point, Hobart, Tasmania.

Tymms, Eric Mortimer, M.B., B.S., 1928 (Univ. Melbourne), 1324, Hay Street, West Perth, Western Australia.

Whitaker, Henry, M.B., B.S., 1928 (Univ. Melbourne), 14, Barnsbury Road, Balwyn.

Williams, Martin Frank, M.B., B.S., 1928 (Univ. Melbourne), 128, Victoria Road, Auburn.

Williams, Noel Swift, M.B., B.S., 1928 (Univ. Melbourne), 22, Mason Street, Hawthorn.

Williams, Walter Edward, M.B., B.S., 1928 (Univ. Melbourne), Chilcote Avenue, Malvern.

Additional qualifications registered:

Ball, Leonard Hunt, F.R.C.S. (England), 1928.

Hembrow, Charles Hugh, F.R.C.S. (England), 1927.

NEW SOUTH WALES.

THE undermentioned have been registered under the provisions of *The Medical Act 1912 and 1915*, of New South Wales, as duly qualified medical practitioners:

Appel, Godfrey Hugh, M.B., B.S., 1928 (Univ. Sydney), Box 22, Warwick, Queensland.

Bradley, Gwendolyn Ruth, M.B., B.S., 1928 (Univ. Sydney), 85, Dalhousie Street, Haberfield.

Breden, Neville Percy, M.B., B.S., 1928 (Univ. Sydney), Newcastle Hospital, Newcastle.

Child, Albert George, M.B., B.S., 1928 (Univ. Sydney), 11, Tebbutt Street, Leichhardt.

Clements, Frederick William Arthur, M.B., B.S., 1928 (Univ. Sydney), 114, Leichhardt Street, Waverley.

Downes, Henry Erskine, M.B., B.S., 1926 (Univ. Melbourne), Customs House, Sydney.

Doyle, Percy Hugh, M.B., 1928 (Univ. Sydney), Caergerie, Campbell Street, Hunter's Hill.

Gammie, Charlotte Isabella, M.B., B.S., 1928 (Univ. Sydney), 69, Dickson Avenue, Artarmon.

Goodwin, Cecil Benjamin, L.R.C.P. (Edinburgh), 1928, L.R.C.S. (Edinburgh), 1928, L.R.F.P.S. (Glasgow), 1928, 90, Milton Street, Ashfield.

Goulston, Eric Hyman, M.B., B.S., 1928 (Univ. Sydney), 9, Billyard Avenue, Elizabeth Bay.

Hennessy, Joseph Patrick, M.B., B.S., 1918 (National University, Ireland), c/o Pacific Forests, Limited, O'Connell Street, Sydney.

Hilliard, Richard, M.R.C.S. (England), 1918, L.R.C.P. (London), 1918, Lindley Avenue, Narrabeen.
 Irwin, Robert Samuel, M.B., 1928 (Univ. Sydney), St. Andrew's College, Newtown.
 Jones, Karl Owen, M.B., B.S., 1928 (Univ. Sydney), 118, O'Connor Street, Haberfield.
 Kee, Harry, M.B., B.S., 1928 (Univ. Sydney), 64, Arden Street, Clovelly.
 Kershaw, Marie Eleanor, M.B., B.S., 1928 (Univ. Sydney), 107, Victoria Road, Bellevue Hill.
 Lazarus, Joseph, M.B., B.S., 1928 (Univ. Sydney), 9, Campbell Street, Waverley.
 Lipscomb, Griffin Thomas, M.B., B.S., 1928 (Univ. Sydney), Wiston, Marathon Road, Darling Point.
 McDonald, Kenneth David, M.B., B.S., 1928 (Univ. Sydney), 109, Burns Bay Road, Lane Cove.
 Mahon, Thomas Patrick, M.B., B.S., 1928 (Univ. Sydney), Tara, The Esplanade, Wagga.
 Murray, Robert Malcolm, M.B., B.S., 1928 (Univ. Sydney), Gamboola, Caboono, Molong.
 Piccles, Jack Walter Lawrence, M.B., 1928 (Univ. Sydney), 104, The Trongate, Granville.
 Pye, Walter Osmond, M.B., B.S., 1928 (Univ. Sydney), 43, Wigram Street, Harris Park.
 Rennie, Harry Maynard, M.B., B.S., 1928 (Univ. Sydney), 24, Wolseley Road, Point Piper.
 Robertson, Mure Royston, M.B., B.S., 1928 (Univ. Sydney), Childers, Queensland.
 Saleh, Michael George, M.B., B.S., 1928 (Univ. Sydney), 148, Eastern Avenue, South Kensington.
 Sweetapple, Algar Gerald, M.B., B.S., 1928 (Univ. Sydney), 21, Village Lower Road, Vaucluse.
 Thomson, George Macdonald, M.B., B.S., 1928 (Univ. Sydney), Yirriyirri, 4, Hale Road, Mosman.
 Trembath, William Richard, M.B., B.S., 1917 (Univ. Melbourne), Commonwealth Laboratory, Lismore.
 Uther, Frederick Bryant, M.B., B.S., 1928 (Univ. Sydney), 8, Devonshire Street, Chatswood.
 Waddington, Roland James, M.B., B.S. (Univ. Sydney), 9, Grosvenor Crescent, Summer Hill.
 Williamson, William Stanley, M.B., B.S. (Univ. Sydney), St. Andrew's College, Newtown.
 Wilson, Francis Henry Hales, M.B., 1928 (Univ. Sydney), St. Paul's College, Newtown.

Books Received.

A SHORTER ANATOMY WITH PRACTICAL APPLICATIONS, by E. Wolff, M.B., B.S. (London), F.R.C.S. (England), 1928. London: H. K. Lewis and Company, Limited. Demy 8vo., pp. 459, with illustrations. Price: 18s. net.

Diary for the Month.

OCT. 15.—New South Wales Branch, B.M.A.: Organization and Science Committee.
 OCT. 16.—Tasmanian Branch, B.M.A.: Council.
 OCT. 16.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
 OCT. 17.—Western Australian Branch, B.M.A.: Branch.
 OCT. 17.—Central Northern Medical Association, New South Wales.
 OCT. 23.—New South Wales Branch, B.M.A.: Medical Politics Committee.
 OCT. 24.—Victorian Branch, B.M.A.: Council.
 OCT. 25.—New South Wales Branch, B.M.A.: Branch.
 OCT. 25.—South Australian Branch, B.M.A.: Branch.
 OCT. 26.—Queensland Branch, B.M.A.: Council.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xvi.

LAUNCESTON PUBLIC HOSPITAL: Resident Medical Officers (2).

SYDNEY HOSPITAL: Clinical Assistants to the Medical Out-Patient's Department (5).

THE OTAGO HOSPITALS BOARD: Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmalm United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. Marrickville United Friendly Societies' Dispensary. People's Prudential Benefit Society. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Contract Practice Appointments in South Australia. Boomeroo Centre Medical Club.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Medical practitioners are requested not to apply for appointments to position at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, Sydney. (Telephones: MW 2651-2.)

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